Case Docket No.: KL-US050678 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	
	:	Appeal No.:__________
Kazumasa FUKAZAWA et al.	:	
	:	Group Art Unit: 3671
Serial No.: 10/681,253	:	
	:	Examiner: Jamie Louise McGowan
Filed: October 9, 2003	:	
	:	**Confirmation No. 7520**
For: BULLDOZER WITH IMPROVED VISIBILITY (As Amended)	:	

APPEAL BRIEF

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APPEAL BRIEF

Commissioner of Patents
United States Patent and Trademark Office
Washington, D.C. 20231

Sir:

For the appeal to the Board of Patent Appeals and Interferences from the decision dated March 11, 2010 of the Examiner finally rejecting claims 19-26, 29, 30, 32-35 and 37-48[1], Appellants-Appellants submit the following brief in accordance with 37 C.F.R. §41.37.

In view of the following analysis of claims 19-26, 29, 30, 32-35 and 37-48, Appellants believe that the unique arrangement of these claims is not disclosed or suggested in the references cited in the Office Action. Thus, Appellants respectfully request that the rejections of claims 19-26, 29, 30, 32-35 and 37-48 be reversed and that claims 19-26, 29, 30, 32-35 and 37-48 be allowed.

If there are any questions regarding this Brief, please feel free to contact the undersigned.

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[1] Appellants have cancelled claims 1-18, 27, 28, 31 and 36.

1. Real Party in Interest

Komatsu Ltd is the owner in the above-identified patent application. Thus, the real party in interest is Komatsu Ltd.

2. Related Appeals and Interferences

Appellants and Appellants' legal representatives believe there are no appeals or interferences related to this Appeal.

3. Status of Claims

Claims 19-26, 29, 30, 32-35 and 37-48 are presently pending in this application. Claims 1-18, 27, 28, 31 and 36 are cancelled. Claims 19-26, 29, 30, 32-35 and 37-48 are rejected under 35 U.S.C. §103(a).

Specifically, claims 19-21, 23-26, 29, 30, 32-35 and 37-48 stand rejected as being unpatentable over the prior art shown in Figure 1 (hereinafter "Figure 1 bulldozer") of the present application in view of U.S. Patent No. 6,793,028 to Pack (hereinafter "Pack patent") and further in view of U.S. Design Patent No. 483,043 to Akashima et al. (hereinafter "Akashima et al. patent").

Moreover, claims 22 and 42 stand rejected as being obvious over the Figure 1 bulldozer in view of the Pack patent and the Akashima et al. patent, and further in view of U.S. Patent No. 6,468,153 to Sheidler et al. (hereinafter "Sheidler et al. patent").

Furthermore, claims 19-21, 23-26, 29, 30, 32-35 and 37-48 stand further rejected as being unpatentable over Japanese Utility Model Patent Application Publication No. 51-63032 to Yoshida (hereinafter "Yoshida publication"), in view of the Figure 1 bulldozer, and further in view of the Akashima et al. patent.

Finally, claims 22 and 42 are further rejected as being obvious over the Yoshida publication in view of the Figure 1 bulldozer and Akashima patent, and further in view of the Sheidler et al. patent.

The finally rejected claims 19-26, 29, 30, 32-35 and 37-48 are the claims on Appeal.

4. Status of Amendments

All amendments submitted in the above-identified application have been entered as of the March 11, 2010 final Office Action (hereinafter "the Office Action"). No amendments have been filed subsequent to the Office Action.

5. Summary of the Claimed Subject Matter

The presently claimed subject matter is basically directed to a bulldozer with improved visibility. The bulldozer recited in claims is illustrated in Figures 2-12, and discussed on pages 5-12 of the specification.

Independent claim 19

The bulldozer (30) comprises a vehicle frame (31), a pair of tracks, a forwardly positioned operator seat, a bulldozer blade (16), a front mounted engine (33), an engine cover (34), a first tank module (35 or 36) and a cooling module (37). See, line 10 on page 5 to line 6 on page 8. The vehicle frame (31) has a front end and a rear end with a center longitudinal axis (x-axis). See, Fig. 7 as reproduced below. The tracks are disposed on left and right sides of the center longitudinal axis (x-axis) of the bulldozer (30), respectively, for supporting the vehicle frame (31). See, lines 12-15 on page 5. The tracks extend rearwardly of the rear end of the vehicle frame (31) to form a cooling module recess that is disposed laterally between the tracks and at a rear end portion of the frame along the center longitudinal axis (x-axis). See, Figs. 5 and 7 as reproduced below. The operator seat is secured to the vehicle frame (31) at a location between the front and rear ends in front of the cooling module recess. See, lines 18-22 on page 5 and Fig. 5 as reproduced below. The bulldozer blade (16) is disposed in front of the front end of the vehicle frame (31) and operatively coupled to the vehicle frame (31). See, Figs. 5 and 7 as reproduced below. The bulldozer blade (16) includes a top center portion (17) disposed along the center longitudinal axis (x-axis) of the bulldozer (30). See, lines 18-20 on page 8. The front mounted engine (33) is disposed at a front portion on the vehicle frame (31) along the center longitudinal axis (x-axis) of the bulldozer (30) that is in front of the operator seat and behind the bulldozer blade (16). See, lines 15-17 on page 5 and Figs. 5 and 7 as reproduced below. The engine cover (34) covers the front mounted engine (33) at the front portion of the vehicle frame (31). See, lines 17-18 on page 5. The engine cover (34) is downwardly angled towards the bulldozer blade (16) along the center longitudinal axis (x-axis) of the bulldozer (30) and aligned vertically above the front mounted engine (33), the operator seat, the engine cover (34) and the bulldozer blade (16) being disposed such that, when a lowest point of the bulldozer blade (16) and a lowest point of the tracks are generally on a horizontal plane, the top center portion (17) of the bulldozer blade (16) is visible over a top sloped surface of the engine cover (34). See, lines 15-20 on page 8, and line 22 on page 8 to line 4 on page 9. The first tank module (35 or 36) disposed on a rear of a first lateral side of the bulldozer (30). See, lines 1-6 on page 6. The cooling module (37) is fluidly coupled to the front mounted engine (33) for cooling the front mounted engine (33). See, lines 9-14 on page 7. The cooling module (37) is coupled to the rear end portion of the vehicle frame (31) within the cooling module recess formed between the tracks. See, lines 7-10 on page 6. At least an upper end of the cooling module (37) is recessed forwardly from a rear end of the first tank module (35 or 36), and a rearmost end of the cooling module (37) is disposed forwardly of a rear end of the tracks. See, Figs. 5 and 7 as reproduced below.

Independent claim 35

The bulldozer (30) comprises a vehicle frame (31), a pair of tracks, a front mounted engine (33), a cooling module (37), a forwardly positioned operator seat, a moveable bulldozer blade (16), an engine cover (34). See, line 10 on page 5 to line 6 on page 8. The vehicle frame (31) has a front end and a rear end with a center longitudinal axis (x-axis). See, Fig. 7 as reproduced below. The tracks extend in a forward-to-aft direction on left and right sides of the center longitudinal axis (x-axis) of the bulldozer (30), respectively, for supporting the vehicle frame (31). See, lines 12-15 on page 5. The tracks extend rearwardly of the rear end of the vehicle frame (31) to form a cooling module recess that is disposed laterally between the tracks and at a rear end portion of the frame along the center longitudinal axis (x-axis). See, Figs. 5 and 7 as reproduced below. The engine (33) is supported on a front portion of the vehicle frame (31) at a location along the center longitudinal axis (x-axis) of the bulldozer (30). See, lines 15-17 on page 5 and Fig. 7 as reproduced below. The cooling module (37) is fluidly coupled to the front mounted engine (33) for cooling the front mounted engine (33). See, lines 9-14 on page 7. The cooling module (37) is arranged at the rear end portion of the vehicle frame (31) within the cooling module recess formed between the tracks such that a rearmost end of the cooling module (37) is disposed forwardly of a rear end of the tracks. See, lines 7-10 on page 6 and Figs. 5 and 7 as reproduced below. The operator seat is secured to the vehicle frame (31) at a location behind the front mounted engine (33) and in front of the cooling module recess. See, lines 18-22 on page 5 and Fig. 5 as reproduced below. The bulldozer blade (16) is disposed in front of the front end of the vehicle frame (31). See, Figs. 5 and 7 as reproduced below. The engine cover (34) is coupled to the vehicle frame (31) and covering the front mounted engine (33). See, lines 17-18 on page 5. The engine cover (34) has a top sloped surface extending along the center longitudinal axis (x-axis) of the bulldozer (30) and aligned vertically above the front mounted engine (33) such that the top sloped surface of the engine cover (34) is downwardly angled towards the bulldozer blade (16) along the center longitudinal axis (x-axis) of the bulldozer (30). See, lines 15-20 on page 8. The top sloped surface of the engine cover (34) and the bulldozer blade (16) are disposed with respect to each other such that a line extending on and forwardly from the top sloped surface of the engine cover (34) intersects with a top center portion (17) of the bulldozer blade (16) when the bulldozer blade (16) is placed on the ground. See, line 22 on page 8 to line 4 on page 9.

Independent claim 44

The bulldozer (30) comprises a vehicle frame (31), a pair of tracks, a forwardly positioned operator seat, a bulldozer blade (16), a front mounted engine (33), an engine cover (34), a first tank module (36), a second tank module (35), and a cooling module (37). See, line 10 on page 5 to line 6 on page 8. The vehicle frame (31) has a front end and a rear end with a center longitudinal axis (x-axis). See, Fig. 7 as reproduced below. The tracks are disposed on left and right sides of the center longitudinal axis (x-axis) of the bulldozer (30), respectively, for supporting the vehicle frame (31). See, lines 12-15 on page 5. The tracks extend rearwardly of the rear end of the vehicle frame (31). See, Figs. 5 and 7 as reproduced below. The operator seat is secured to the vehicle frame (31) at a location between the front and rear ends. See, lines 18-22 on page 5 and Fig. 5 as reproduced below. The bulldozer blade (16) is disposed in front of the front end of the vehicle frame (31) and operatively coupled to the vehicle frame (31). See, Fig. 5 as reproduced below. The bulldozer blade (16) includes a top center portion (17) disposed along the center longitudinal axis (x-axis) of the bulldozer (30). See, lines 18-20 on page 8. The engine (33) is disposed at a front portion on the vehicle frame (31) along the center longitudinal axis (x-axis) of the bulldozer (30) in front of the operator seat and behind the bulldozer blade (16). See, lines 15-17 on page 5, and Figs. 5 and 7 as reproduced below. The engine cover (34) covers the front mounted engine (33). See, lines 17-18 on page 5. The engine cover (34) has a top sloped surface extending along the center longitudinal axis (x-axis) of the bulldozer (30) and aligned vertically above the front mounted engine (33) such that the top sloped surface of the engine cover (34) is downwardly angled towards the bulldozer blade (16) along the center longitudinal axis (x-axis) of the bulldozer (30). See, lines 15-20 on page 8. The top sloped surface of the engine cover (34) and the bulldozer blade (16) are disposed with respect to each other such that a line extending on and forwardly from the top sloped surface of the engine cover (34) intersects with a top center portion (17) of the bulldozer blade (16) when the bulldozer blade (16) is placed on the ground. See, line 22 on page 8 to line 4 on page 9. The first tank module (35 or 36) is disposed on a rear of a first lateral side of the bulldozer (30). See, lines 4-6 on page 6. The second tank module is disposed on a rear of a second lateral side of the bulldozer (30) with a cooling module recess being formed laterally between the first and second tank modules at a rear end portion of the frame along the center longitudinal axis (x-axis). See, lines 1-4 and 8-10 on page 6. The cooling module (37) is fluidly coupled to the front mounted engine (33) for cooling the front mounted engine (33). See, lines 9-14 on page 7. The cooling module (37) is coupled to the rear end portion of the vehicle frame (31) within the cooling module recess with a rearmost end of the cooling module (37) being recessed forwardly from rear ends of the first and second tank modules. See, lines 7-10 on page 6 and Figs. 5 and 7 as reproduced below.

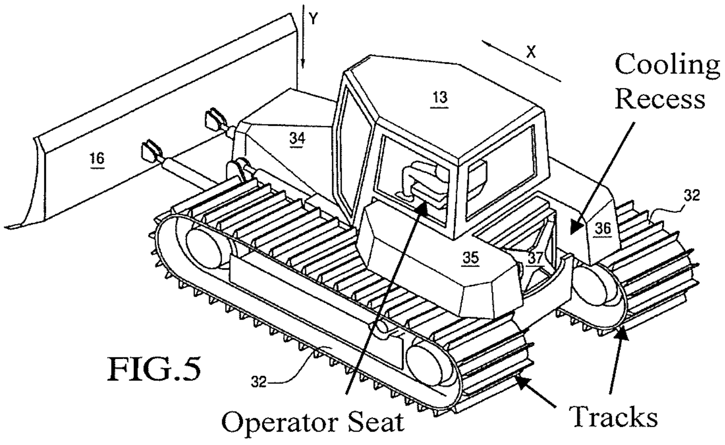
FIG.5

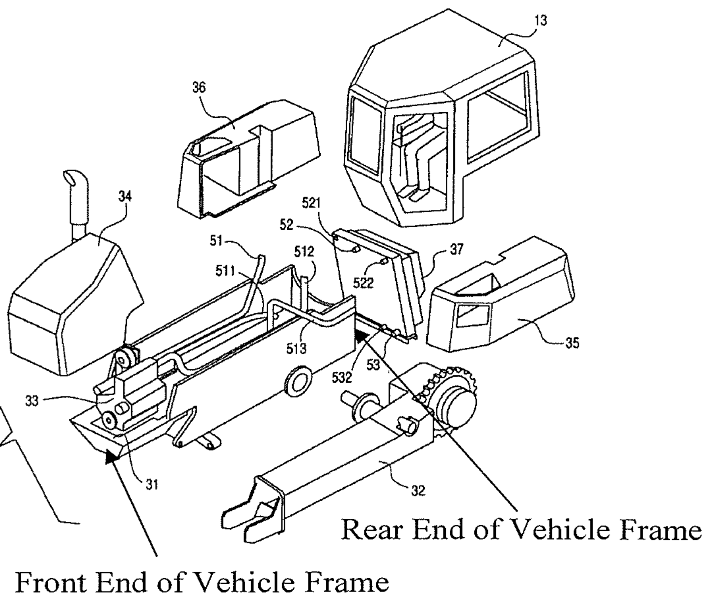
FIG.7

6. Grounds of Rejections to Be Reviewed on Appeal

The following grounds of rejection are presented for review on Appeal:

(A) Whether claims 19-21, 23-26, 29, 30, 32-35 and 37-48 are unpatentable under 35 U.S.C. §103(a) as being obvious over the Figure 1 bulldozer in view of the Pack patent and further in view of the Akashima et al. patent;

(B) Whether claims 22 and 42 are unpatentable under 35 U.S.C. §103(a) as being obvious over the Figure 1 bulldozer in view of the Pack patent and the Akashima et al. patent, and further in view of the Sheidler et al. patent;

(C) Whether claims 19-21, 23-26, 29, 30, 32-35 and 37-48 are unpatentable under 35 U.S.C. §103(a) as being obvious over the Yoshida publication in view of the Figure 1 bulldozer and further in view of the Akashima et al. patent; and

(D) Whether claims 22 and 42 are unpatentable under 35 U.S.C. §103(a) as being obvious over the Yoshida publication in view of the Figure 1 bulldozer and the Akashima et al. patent, and further in view of the Sheidler et al. patent.

7. *Argument*

Claims 19-26, 29, 30, 32-35 and 37-48 are patentable over the Figure 1 bulldozer, the Pack patent, the Akashima et al. patent, the Sheidler et al. patent and the Yoshida publication under 35 U.S.C. §103(a) as further discussed below.

(A) REJECTION UNDER 35 U.S.C. §103(a) OVER THE FIGURE 1 BULLDOZER IN VIEW OF THE PACK PATENT AND FURTHER IN VIEW OF THE AKASHIMA ET AL. PATENT

Claims 19, 20, 21, 24, 30, 32, 33 and 34

None Of The Applied Prior Art Shows "Cooling Module Recess" and Arrangement of Cooling Module with respect to First Tank Module and Tracks

Independent claim 19 recites the tracks extend rearwardly of the rear end of the vehicle frame ***to form a cooling module recess*** that is disposed laterally ***between the tracks*** and at a rear end portion of the frame along the center longitudinal axis. Moreover, independent claim 19 further recites at least ***an upper end of the cooling module*** is ***recessed forwardly*** from a rear end of the ***first tank module*** that is disposed on a rear of a first ***lateral side*** of the bulldozer, and a ***rearmost end of the cooling module*** is disposed ***forwardly*** of a ***rear end of the tracks***. Clearly, ***none*** of the Figure 1 bulldozer, the Pack patent, and the Akashima et al. patent discloses or suggests this ***cooling module recess*** and an arrangement of the cooling module therein with respect to the first tank module and the tracks.

The Office Action asserts it would have been obvious to move the radiator of the Figure 1 bulldozer to the rear side of the vehicle as taught by the Pack patent to provide better visuals for the operator. Then, the Office Action further asserts, in such a combination, the cab would have to be shifted forward, which would result in forming a cooling module recess. However, Appellants note ***nothing*** in the applied prior art teaches ***shifting*** a cab or any part of a bulldozer to ***form a cooling module recess*** between a pair of tracks of the bulldozer. The Office Action states several reasons why the cab would have to be shifted forward: to account for an imbalance that would be created from placing the cooling module behind the cab; to have a clearer view of a front side of the vehicle by moving the cab closer to the front; or to protect the cooling module from damage by not allowing it to hang out over the rear edge of the tracks. However, ***none*** of those alleged reasons for shifting the cab forward is supported by any evidence in the record or by any factual foundation. The Supreme Court has stated that "[r]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Moreover, the Federal Circuit has clarified that an examiner may not invoke "good common sense" to reject a patent application without some factual foundation, where "basic knowledge and common sense was not based on any evidence in the record." *Perfect Web Technologies Inc. v. InfoUSA Inc.*, 92 USPQ2d 1849 at 1853 (Fed. Cir. 2009) quoting *In re Zurko*, 258 F.3d 1379, 1383, 1385 [59 USPQ2d 1693] (Fed. Cir. 2001)

Moreover, regarding the combination with the Akashima et al. patent, the Office Action asserts as follows:

> [The] Pack [patent] is used in combination to applicant's Figure 1 admitted prior art. When the cooling module is moved to the rear end of the bulldozer and the cab is shifted forward to account for the imbalance, ***no tanks exist***. The Akashima combination is then made to include the first and second tank modules; therefore, the tanks could be placed in any desirable position. (emphasis added)

In other words, the Office Action appears to assert one having ordinary skill in the art would have ***completely disregarded*** an existing arrangement of the tank in the Figure 1 bulldozer when combining the teaching of the Pack patent regarding the arrangement of the cooling module, and once the cab is shifted forward "to account for an imbalance," the tanks would have been rearranged in view of the Akashima et al. patent to accommodate the new cooling module arrangement. Appellants respectfully assert the logic employed by the Office Action is seriously flawed in that it would be ***impossible*** to account for an imbalance or even to recognize any imbalance in the vehicle when large components such as the tanks are completely disregarded. Moreover, adding the missing tank in view of the Akashima et al. patent after the cab is shifted to account for an imbalance would most likely disturb the weight balance of the vehicle, which undermines the alleged purpose of "accounting for an imbalance" for shifting the cab. Appellants respectfully assert one having ordinary skill in the art would not have completely disregarded the existing arrangement of the tank in the Figure 1 bulldozer if the one were to combine the teaching of the Pack patent to the Figure 1 bulldozer.

More specifically, as discussed in the Mukaino's third Declaration (Evidence Appendix 8), one having ordinary skill in the art would reasonably ascertain by looking at Figure 1 of the present application that, in the Figure 1 bulldozer, the fuel tank laterally extends on the rear side of the cab to accommodate the large-sized fuel tank of the bulldozer. Please see Figure 1 of the present application and Exhibit D of the Mukaino's third Declaration as reproduced below.

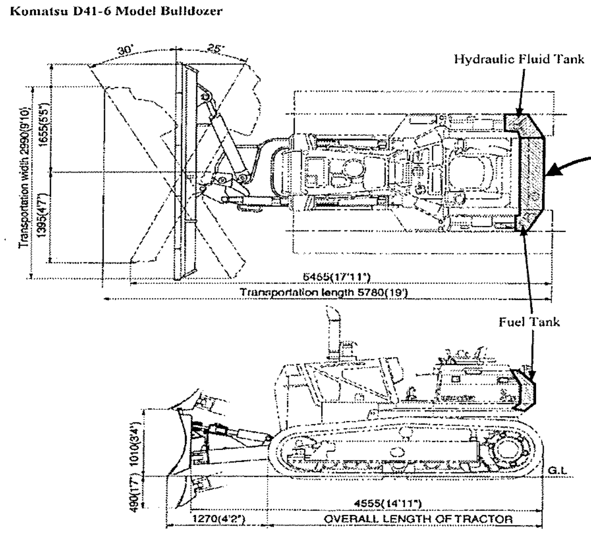
Komatsu D41-6 Model Bulldozer
30°
25°
Hydraulic Fluid Tank
Transportation width 2990(9'10")
1655(5'5")
1395(4'7")
5455(17'11")
Transportation length 5780(19')
Fuel Tank
1010(3'4")
490(1'7")
G.L.
4555(14'11")
1270(4'2")
OVERALL LENGTH OF TRACTOR

Exhibit D to Mukaino's Third Declaration (Evidence Appendix 8)

Fuel Tank Extends Laterally Behind Cab

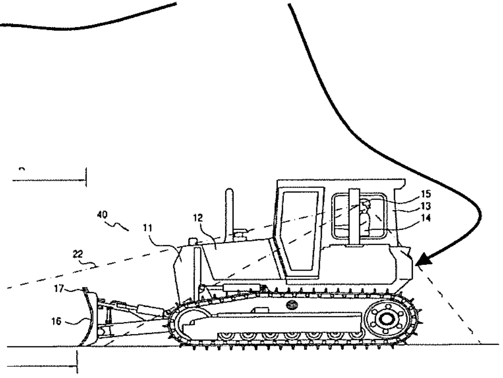

Figure 1 Bulldozer (Prior Art)

Therefore, shifting only the cab forward as alleged in the Office Action does not create a space between the tracks since the vehicle frame (on which the cab is placed) and the fuel tank would still remain in the same positions. In other words, creating a recess between the tracks involves not only shifting the cab forward as alleged by the Office Action but also shifting the fuel tank forward along with the cab or relocating the fuel tank somewhere else. However, Appellants respectfully assert one of ordinary skilled in the art having common sense would ***not*** have considered it obvious to rearrange the cab and the fuel tank to form a cooling module recess because (1) placing the cooling module on the rear side of the vehicle would not create an imbalance as alleged in the Office Action, and (2) rearranging the cab and the fuel tank would rather cause a greater imbalance in weight distribution of the bulldozer.

The Office Action asserts it would have been obvious to shift the cab forward and obtain the claimed arrangement in order to account for an imbalance created by placing the cooling module behind the cab. However, as stated in the Mukaino's third Declaration, the weight of the today's cooling module is usually so small with respect to total weight of the bulldozer that placing the cooling module on the rear side of the vehicle in the bulldozer does not create a tremendous imbalance in weight distribution, which requires considerable rearrangement of the parts of the bulldozer[2]. The July 22, 2010 Advisory Action appears to indicate that the broad statement that the cooling module would not present an imbalance is difficult to show because the bulldozers and cooling modules come in many different sizes. However, in general, the size of the cooling module is proportional to the size of the bulldozer. Moreover, the Mukaino's third Declaration provides examples of different sizes of the bulldozer, which shows the cooling module accounts for only about 1 % of the total weight of the bulldozer in each of the examples. Thus, Appellants have shown that with sufficient evidence that placing the cooling module on the rear side of the vehicle in the bulldozer does not create a tremendous imbalance in weight distribution, which requires considerable rearrangement of the parts of the bulldozer. Accordingly, one of ordinary skilled in the art having common sense would ***not*** have considered it obvious to rearrange the cab and the fuel tank for the reason of accounting for an imbalance caused by moving the cooling module as alleged by the Office Action.

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[2] Appellants note that the Yoshida publication discloses moving a radiator and a fan makes an influence on a location of the center of gravity of a track loader. However, as discussed in the Mukaino's third

Moreover, if the fuel tank also needs to be shifted forward with the cab or somehow relocated to somewhere else as discussed above, one could reasonably expect ***a greater imbalance*** (though still not significant in terms of the weight balance of a bulldozer) in weight distribution in the bulldozer as compared to an alleged imbalance caused by moving the cooling module since a full fuel tank is usually heavier than the cooling module. Accordingly, one of ordinary skilled in the art having common sense would ***not*** have considered it obvious to rearrange the cab and the fuel tank to obtain a cooling module recess for any of the reasons alleged by the Office Action.

The Office Action further asserts, even if a significant imbalance was not created, one of ordinary skill in the art would still have shifted the cab forward so as to protect the cooling module from damage by not allowing it to hang out over the rear edge of the tracks. Again, the Office Action fails to provide any evidence in the record or factual foundation to support this statement. On the contrary to the assertion by the Office Action, the Yoshida publication shows a structure that allows the cooling module to hang out over the rear edge of the tracks. In the Yoshida publication, the radiator and the fan are protected by providing a cover member around them. Thus, the Yoshida publication clearly shows it is ***not*** a matter of common sense as alleged by the Office Action to shift the cab forward to protect the cooling

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Declaration, the same is not true in the case of a modern bulldozer such as one shown in Figure 1 of the module. Therefore, even if one having ordinary skill in the art were to modify the Figure 1 bulldozer to place the cooling module on the rear side of the vehicle in view of the Pack patent, nothing in the record provides an ***apparent reason*** for one having ordinary skill in the art to shift the cab forward to protect the cooling module. The mere fact that the prior art can be modified does ***not*** make the modification obvious, unless an ***apparent reason*** exists based on evidence in the record or scientific reasoning for one of ordinary skill in the art to make the modification. *KSR at* 1741.

The Office Action also asserts if one were to take the teaching of the Pack patent and use it in the Figure 1 bulldozer, they would not simply tack it on to the machine, and it would have been well within the skill of one of ordinary skill in the art to shift the cab forward so that the footprint of the cab and engine compartment would remain the same. Again, the Office Action fails to provide any evidence in the record or factual foundation to support this statement. On the contrary to the assertion in the Office Action, the Yoshida publication apparently shows an example that the radiator and the fan are simply tacked onto the machine. Therefore, even if one having ordinary skill in the art were to modify the Figure 1 bulldozer to place the cooling module on the rear side of the vehicle in view of the Pack patent, nothing in the record provides an ***apparent reason*** for one having ordinary skill in the art to shift the cab forward so that the footprint of the cab and engine compartment would remain the same.

Finally, the Office Action further appears to assert one would shift the cab forward so that the cab is placed closer to the front side of the vehicle to have a clear view. However, if one were to shift the cab forward to achieve a clearer view of the front side, the frame (on which the cab is mounted) and/or the fuel tank would still remain in the same positions, and thus, no recess would be formed between the tracks. More specifically, as discussed above,

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present application.

in order to form a cooling module recess between the tracks in the Figure 1 bulldozer by shifting the cab forward as alleged by the Office Action, the fuel tank also needs to be shifted forward or relocated to somewhere else. The alleged reason of "providing clearer view of the front" would ***not*** give any apparent reason for one skilled in the art to rearrange the cab and the fuel tank ***to form a cooling module recess*** between the tracks as recited in independent claim 19.

Furthermore, even if assuming for the sake of argument that one having ordinary skill in the art were to rearrange the cab and the fuel tank to place the cooling module behind the cab, there is ***nothing*** in the applied prior art that suggests one skilled in the art to arrange the cooling module with respect to the first tank module so that at least ***an upper end of the cooling module*** is ***recessed forwardly*** from a rear end of the ***first tank module.*** As discussed above, one having ordinary skilled in the art would reasonably ascertain that the tank extends laterally behind the cab in the Figure 1 bulldozer. Therefore, even if the cooling module were moved to the rear side of the vehicle in the Figure 1 bulldozer in view of the Pack patent, the cooling module would be placed behind the fuel tank in the combination of the Figure 1 bulldozer and the Pack patent. Thus, the cooling module would be placed rearward of the tank in the combination. Therefore, the combination fails to disclose or suggest at least ***an upper end of the cooling module*** is ***recessed forwardly*** from a rear end of the ***first tank module*** as recited in independent claim 19. The Office Action appears to assert the Akashima et al. patent shows an arrangement of a tank disposed on either side of a work vehicle. However, as discussed above, the Office Action fails to provide any articulated reasoning as to why one having ordinary skill in the art would have ***completely disregarded*** the existing arrangement of the tank in the Figure 1 bulldozer, and then conveniently rearranged a tank on a lateral side of the bulldozer in view of the Akashima et al. patent to obtain the claimed arrangement. Such a rearrangement of the tank in view of the Akashima et al. patent after the cab is shifted would most likely disturb the weight balance of the vehicle, which undermines the alleged purpose of "accounting for an imbalance" for shifting the cab.

Accordingly, Appellants respectfully assert the Office Action's conclusion of obviousness has no factual foundation and is based on improper hindsight reasoning.

Present Case Exhibits Strong Showing Of Objective Evidence Of Nonobviousness

Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness, which is part of the four-part test set forth in *Graham*. Thus, the objective evidence relevant to the issue of obviousness (sometimes referred to as "secondary considerations") must be evaluated in determining the obviousness of the present invention.

The following documents as objective evidence of nonobviousness are of record in the present application:

A. The article appeared in CONSTRUCTION EQUIPMENT magazine which discusses the review of Komatsu D51PX-22 bulldozer having the claimed features by Jim Schultheis (Evidence Appendix 2);

B. The December 2007 issue of CONSTRUCTION EQUIPMENT magazine which selected Komatsu D51 bulldozer as the first one to be introduced as one of the top 100 new products of 2007 (Evidence Appendix 3);

C. The printouts of the IDEA International Design Excellence Awards '08 official website, which awarded Komatsu D51 bulldozer the Silver award (Evidence Appendix 4);

D. January 2009 issue of EARTHMOVERS magazine which discusses the review of the Komatsu D51PX-22 bulldozer having the claimed features by Mr. Geoff Ashcroft (Evidence Appendix 6); and

E. Komatsu D51EX-22/D51PX-22 Crawler Dozer Catalog (Evidence Appendix 7).

The document A-D submitted in the present application provide strong showing of the industry praise for the Komatsu D51 bulldozer having the claimed features, which solved a ***long-felt need*** for improved blade visibility in the bulldozer. The document D (the Komatsu D51EX-22/D51PX-22 Crawler Dozer Catalog) was submitted to show a clear ***link*** between the long-felt need and a claimed feature that distinguishes over the prior art. More specifically, as clearly shown in the Komatsu D51EX-22/D51PX-22 Crawler Dozer Catalog, the Komatsu D51EX-22/D51PX-22 (hereinafter "Komatsu D51 bulldozer") has the claimed features recited in independent claim 19. As seen on pages 2 and 3 in the Komatsu D51 bulldozer catalog, the Komatsu D51 bulldozer includes an arrangement in which the operator seat, the engine cover and the bulldozer blade are disposed such that when a lowest point of the bulldozer blade and a lowest point of the tracks are generally on a horizontal plane and the top center portion of the bulldozer blade is visible over a top sloped surface of the engine cover, and the cooling module is coupled to a rear end portion of the vehicle frame as recited in independent claim 19.

Appellants agree with the assertion in the Office Action that the mere fact the invention is being well received does not necessarily mean the product is nonobvious. However, Appellants respectfully assert the objective evidence submitted in the present application not only shows that the Komatsu D51 bulldozer having the claimed features was well received in the industry, but also shows that it was received the industry praise as a "new and exciting" product as also acknowledged in the Office Action. Appellants believe the Komatsu D51 bulldozer has been praised in the industry as "new and exciting" because it solved a ***long-felt need*** for improved blade visibility in the bulldozer which is being claimed.

More specifically, the Mukaino's second Declaration (Evidence Appendix 5) clearly shows that there has been an inherent long-felt need for improved blade visibility in the conventional bulldozers. As discussed in the Mukaino's second Declaration, when operating the conventional bulldozer, the visibility of the top center portion of the blade from the operator is blocked by the radiator or radiator assembly and the engine hood. There have been several problems associated with not being able to see the top center portion of the blade. However, due to structural/design limitations of the conventional bulldozers, a solution to those problems was considered unavailable, as discussed in the Mukaino's second Declaration. Therefore, the operator must estimate the location of the bulldozer blade during use based on his or her experience when operating the conventional bulldozer, and it usually takes a long time for an inexperienced operator to learn this skill. Thus, although it might not be explicitly recognized as "needs" in the industry, Appellants believe there has been in fact an inherent long-felt need for improved blade visibility to solve the problems discussed in the Mukaino's second Declaration. Appellants respectfully assert both articles in CONSTRUCTION EQUIPMENT magazine and EARTHMOVERS magazine also serve as the objective evidence showing that one skilled in the art recognized those problems existed in the art for a long period of time without solution of this long-felt need. More specifically, the article appeared in CONSTRUCTION EQUIPMENT magazine introduces the comments by Mr. Jim Shultheis, who has 40 years of experience as a professional operator, indicating that the engine hood is usually in the way of visibility to the blade in a conventional bulldozer, and it took a long time for a new operator to learn how to operate the conventional bulldozer (see, the second last paragraph on the second page). In the article in EARTHMOVERS magazine, Mr. Ashcroft states the improved visibility to the blade "means no more guessing where the cutting edges might be ..., which means there's hope for the inexperienced" (see, line 37 in the middle column to line 1 in the right column on page 9).

The Mukaino's second Declaration and both of these articles (objective evidence) show the long felt need for improved blade visibility had been a persistent one that was recognized by those of ordinary skill in the art, and this long-felt need had not been satisfied before the invention by Appellants.

The Office Action indicates the Mukaino's second Declaration is insufficient to overcome the rejection because long-felt need must not have been satisfied by another before the invention by applicant, and both the Pack patent and the Yoshida publication disclose moving the radiator on a work vehicle to the rear of the vehicle thereby allowing the front hood of the vehicle to be slanted down for increased visibility.

Appellants respectfully disagree with the assertion in the Office Action in that ***neither*** the Pack reference ***nor*** the Yoshida reference discloses ***a bulldozer*** having ***a bulldozer blade***, to which the pending claims are clearly directed. More specifically, the Pack reference discloses a truck, and the Yoshida publication discloses a track loader with a bucket instead of a bulldozer blade as claimed. Therefore, neither the Pack reference nor the Yoshida reference satisfies a long-felt need for improved ***blade*** visibility in a ***bulldozer*** as claimed. The July 22, 2010 Advisory Action asserts the fact that these references use different attachments instead of a bulldozer blade is not as important as the fact that they have increased blade visibility by moving the cooling system to the rear of the agricultural vehicle. Appellants respectfully disagree and assert that a problem of poor viability is far more significant in a case of a bulldozer blade, which is almost always stays on the ground, as compared to a bucket of a truck loader which can be raised and easily seen by the operator during normal operation.

In fact, the objective evidence previously submitted by Appellants clearly shows that an art recognized problem of poor ***blade*** visibility existed in the art for a long period of time without a viable solution, and only the ***bulldozer*** having the claimed features solved this long-felt need for improved ***blade visibility***.

In the article appeared in CONSTRUCTION EQUIPMENT magazine, Mr. Jim Shultheis comments that "this is ***the only tractor I've been on that lets you see the center of the blade***" (emphasis added). In EARTHMOVERS magazine, Mr. Ashcroft writes "[Komatsu D51PX-22] sees the adoption of an almost mid-mounted cab and a steeply sloping nose that ***provides a level of visibility previously unattainable on any cabbed dozer design***" (emphasis added). The December 2007 issue of CONSTRUCTION EQUIPMENT magazine refers to the Komatsu D51 bulldozer as "providing ***best-in-class blade visibility***". The Komatsu D51 bulldozer was awarded the Silver award in International Design Excellence Award (IDEA) '08 because its engine hood design "represents ***the first time in the history of dozers*** that the entire top of the dozer blade is visible from the cabin at all times" (emphasis added) and "[t]his new design assures an improvement in fundamental dozer work parameters". The objective evidence clearly shows that the industry praise was given to the Komatsu D51 bulldozer having the claimed features for improving the visibility of the blade.

Moreover, Appellants would like to point out the Pack patent, for which a patent application was filed in 1999, is assigned to the Caterpillar S.A.R.L., which is apparently a European subsidiary of Caterpillar Inc. It is well known that Caterpillar Inc. also manufactures bulldozers. However, as discussed in the Mukaino's Declaration submitted on July 28, 2008, to his knowledge, the arrangement of the cooling module disclosed in the Pack patent has never been applied to any model of the Caterpillar's bulldozers since the patent application matured in the Pack patent was filed more than 9 years ago. Also, as discussed in the Mukaino's Declaration, to his knowledge, none of the bulldozer manufactures has adapted the arrangement of the cooling module disclosed in the Pack patent in the bulldozers since the application matured in the Pack patent was first published over 6 years ago. Thus, despite the long felt need for improved visibility in the conventional bulldozers, no one had adapted the cooling module arrangement disclosed in the Pack patent to the conventional bulldozer to obtain the claimed arrangement prior to the present invention.

Appellants believe the objective evidence strongly indicates that it would ***not*** have been obvious for one of ordinary skilled in the pertinent art to combine the teachings of the Figure 1 bulldozer, the Pack patent and the Akashima et al. patent to obtain the claimed arrangement.

Appellants believe that dependent claims 20, 21, 24, 30, 32, 33 and 34 are also allowable over the applied prior art in that they depend from independent claim 19, and therefore, are allowable for the reasons stated above. Also, the dependent claims are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claim 19, the applied prior art also fails to disclose or suggest the bulldozer as set forth in the dependent claims 20, 21, 24, 30, 32, 33 and 34.

Claim 23

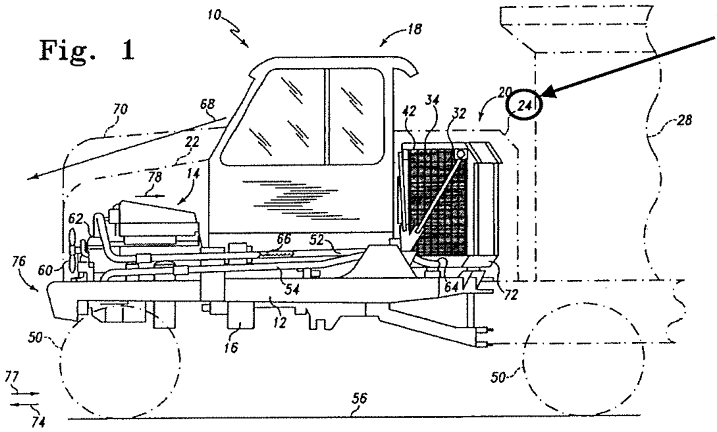
Claim 23 states the cooling module is mounted behind the cab such that a ***plane of the fan slopes downward*** towards the rear of the bulldozer. Appellants respectfully assert such a specific orientation of the fan of the cooling module is ***not*** disclosed or suggested by the Figure 1 bulldozer, the Pack patent, the Akashima et al. patent or any other applied prior art.

The Office Action refers to an upper corner of the radiator cowl 24 shown in Figure 1 of the Pack patent to allegedly show the limitation of claim 23. However, the Pack patent clearly shows in Figures 2 and 3 that the plane of the fan 30 extends vertically, and thus, the Pack patent ***fails*** to disclose or suggest the plane of the fan slopes downward towards the rear as recited in claim 23.

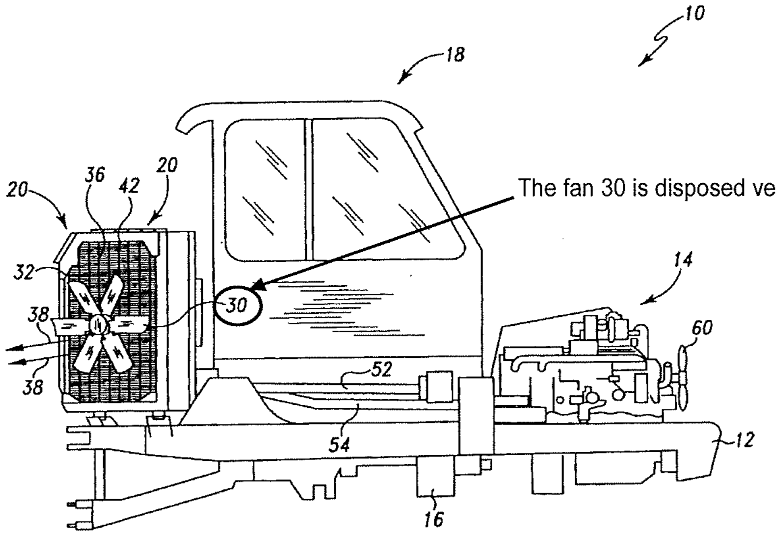
Moreover, in the Pack patent, the fan 30 is arranged to draw a large volume of air through cooling core 32 from a front side of the radiator to a rear side of the radiator (see, lines 54-61 in column 3 of the Pack patent). Therefore, modifying the orientation of the fan 30 such that a plane of the fan slopes downward towards the rear would most likely impede the air pulling efficiency of the fan 30. Therefore, Appellants believe one having ordinary skill in the art would not have considered it obvious to modify the orientation of the fan 30 of the Pack patent to obtain the arrangement recited in claim 23.

Accordingly, claim 23 is not rendered obvious over the applied prior art.

Fig. 1



This is clearly *not* a plane of a fan.



The fan 30 is disposed vertically.

Fig. 2

Claim 29

Claim 29 recites the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module***. In rejecting this claim, the Office Action only provides conclusory statement that "the combination discloses the cooling module is capable of being completely recessed forwardly from the rear ends of the first and second tanks". Appellants respectfully disagree with this assertion of the Office Action.

More specifically, there is ***nothing*** in the applied prior art that suggests the cooling module is arranged with respect to the first tank module so that the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module.*** As discussed above, one having ordinary skilled in the art would reasonably ascertain that the tank extends laterally behind the cab in the Figure 1 bulldozer. Therefore, even if the cooling module were moved to the rear side of the vehicle in view of the Pack patent, the cooling module would be placed behind the fuel tank in the combination of the Figure 1 bulldozer and the Pack patent. Thus, the cooling module will be placed ***rearward*** of the tank. The Office Action appears to assert the Akashima et al. patent shows an arrangement of a tank disposed on either side of a work vehicle. However, the Office Action ***fails*** to provide any articulated reasoning as to why one having ordinary skill in the art would have completely disregarded the existing arrangement of the tank in the Figure 1 bulldozer, and then, conveniently rearrange a tank on a lateral side of the bulldozer in view of the Akashima et al. patent to obtain the claimed arrangement.

Moreover, even if the combination with the Akashima et al. patent were possible, which is certainly not true, nothing in the applied prior art teaches arranging the cooling module in such a position that the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module.***

Accordingly, claim 29 is not rendered obvious over the applied prior art.

Claim 35, 37, 41 and 43

Independent claim 35 is directed to a bulldozer having similar structures recited in independent claim 19, except that independent claim 35 does not include the limitation relating to the first tank module, and independent claim 35 defines spacial relationship between the top sloped surface of the engine cover and the bulldozer blade.

The similar arguments supporting nonobviousness as asserted in relation to independent claim 19 also apply to independent claim 35. More specifically, Appellants believe one of ordinary skilled in the art having common sense would ***not*** have considered it obvious to rearrange the cab and the fuel tank of the Figure 1 bulldozer to obtain a cooling module recess because (1) placing the cooling module on the rear side of the vehicle would not create an imbalance as alleged by the Office Action, and (2) rearranging the cab and the fuel tank would rather cause a greater imbalance in weight distribution of the bulldozer, as discussed above. Moreover, other reasons for shifting the cab forward asserted in the Office Action are not supported by any evidence in the record or factual foundation as discussed above. Furthermore, Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness by the documents A-E of record, as discussed above.

In addition, independent claim 35 defines a spacial relationship between the top sloped surface of the engine cover and the bulldozer blade that is not disclosed in the cited references. In particular, independent claim 35 recites a bulldozer with a bulldozer blade in which the engine cover having a top sloped surface being disposed with respect to the bulldozer blade such that a line extending on and forwardly from the top sloped surface of the engine cover intersects with a top center portion of the bulldozer blade when the bulldozer blade is placed on the ground. The prior art cited against independent claim 35 does not disclose this spacial relationship. In particular, the Figure 1 bulldozer does not have this spacial relationship. Neither the Pack patent nor the Akashima et al. patent discloses a bulldozer blade. Thus, the combination of these references cannot disclose this spacial relationship of independent claim 35. Accordingly, Appellants believe independent claim 35 is allowable over the applied prior art.

Appellants believe that dependent claims 37, 41 and 43 are also allowable over the applied prior art in that they depend from independent claim 35, and therefore, are allowable for the reasons stated above. Also, the dependent claims are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claim 35, the applied prior art also fails to disclose or suggest the bulldozer as set forth in the dependent claims 37, 41 and 43.

Claim 38

Claim 38 recites a first tank module disposed on a rear of a first side of the bulldozer, with a rear end of the cooling module being disposed forward of a rear end of the first tank module. This limitation is substantially the same as the limitation relating to the first tank module recited in independent claim 19. As discussed above in relation to claim 19, Appellants believe the specific arrangement of the cooling module that is disposed forward of a rear end of the first tank module cannot be rendered obvious by the combination of the Figure 1 bulldozer, the Pack patent, and the Akashima et al. patent. Accordingly, Appellants believe claim 38 is allowable over the applied prior art.

Claims 39 and 40

Claim 39 depends from claim 38 and recites a second tank module disposed on a rear of a second side of the bulldozer, with the rear end of the cooling module being disposed forward of a rear end of the second tank module. Thus, claim 39 requires a first tank module disposed on a rear of a first side of the bulldozer and a second tank module disposed on a rear of a second side of the bulldozer with the rear end of the cooling module being disposed forward of rear ends of the first and second tank modules. This limitation is the same as the limitation in claim 44 relating to the first and second tank modules. Thus, the same arguments asserted regarding the limitations of the first and second fuel tanks in claim 44, discussed in more detail below, apply to the limitations recited in claim 39. Accordingly, Appellants believe claim 39 is allowable over the applied prior art.

Appellants believe that dependent claim 40 is also allowable over the applied prior art in that this claim depends from claim 39, and therefore, is allowable for the reasons stated above. Also, dependent claim 40 is further allowable because it includes additional limitation. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in claim 39, the applied prior art also fails to disclose or suggest the bulldozer as set forth in the dependent claim 40.

Claims 44-48

Independent claim 44 is directed to a bulldozer having similar structures recited in independent claim 19, except that independent claim 44 does not require a cooling module recess being formed between the tracks, but instead independent claim 44 further recites a second tank module disposed on a rear of a second side of the bulldozer with a ***cooling module recess*** being formed laterally ***between the first and second tank modules*** at a rear end portion of the frame along the center longitudinal axis. Moreover, claim 44 also recites the rearmost end of the cooling module is ***recessed forwardly*** from ***rear ends of the first and second tank modules***. Clearly, this unique arrangement of the bulldozer is neither disclosed nor suggested by the applied prior art, whether taken singularly or in combination.

None of Prior Art References of Record Discloses Two Tank Modules Disposed On Rear of Both Lateral Sides of a Bulldozer

The Office Action apparently relies on the Akashima et al. patent to show two tank modules on a rear of both lateral sides of a work vehicle to form a cooling module recess therebetween as recited in independent claim 44.

However, one having ordinary skill in the art would ***not*** reasonably ascertain that the Akashima et al. patent discloses ***two*** tanks. More specifically, as stated in the Mukaino's third Declaration, one having ordinary skill in the art could not reasonably ascertain based on the drawings of the Akashima et al. patent that the Akashima et al. patent discloses a tank disposed on the left side of the operator seat. In fact, as stated in the Mukaino's third Declaration, the description in the Japanese priority design application of the Akashima et al. patent states that ***a battery and a battery cover*** are disposed on the left side of the operator seat while a fuel tank module is disposed on the left side of the operator seat. Thus, at best understood, the Akashima et al. patent only discloses ***one tank*** that is disposed on one of the lateral sides of the work vehicle.

In the July 22, 2010 Advisory Action, the Examiner asserts applicants' specification provides no definition for the term "tank" therefore the battery compartment or whatever it may be reads on the claim term tank. Appellants respectfully assert such an interpretation of the term "tank" is ***not*** consistent with the interpretation that those skilled in the art would reach. The broadest ***reasonable*** interpretation of the claims ***must*** also be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999) One of the ordinary meanings of the term "tank" is "a usually large receptacle for holding, transporting, or ***storing liquids*** (as water or fuel)" (emphasis added) according to the Merriam-Webster website (www.m-w.com). Moreover, the specification of the present application uses the term "tank" with reference to "a hydraulic tank module 35 for supplying ***hydraulic fluid*** to working implements of the work vehicle" and "a fuel tank module 36 for supplying ***fuel*** to the engine 33", which is commensurate with the ordinary meaning. Thus, one of ordinary skill would construe the term "tank" in claim 44 to mean a large receptacle for holding, transporting or storing ***liquids***. Accordingly, Appellants respectfully assert that interpretation of the "tank" of claim 44 to cover "the battery compartment or whatever it may be" in the Akashima et al. patent is ***not*** consistent with the specification of the present application, and also ***not*** consistent with the interpretation that those skilled in the art would reach. Thus, Applicants respectfully assert the Akashima et al. patent fails to disclose or suggest to one having skilled in the art that the work vehicle has two tank modules on a rear of both lateral sides.

Moreover, as stated in the Mukaino's third Declaration, a fuel tank of a bulldozer commonly extends laterally on the rear side of the cab. For example, as shown in Exhibit D attached to the Mukaino's third Declaration, the fuel tank is disposed behind the cab to extend laterally in the Komatsu D41-6 model bulldozer, which basically corresponds to the bulldozer shown in Figure 1 of the present application. Thus, the Figure 1 bulldozer also fails to disclose or suggest two tank modules on a rear of both ***lateral sides*** of the bulldozers.

Accordingly, ***none*** of the applied prior art discloses, or reasonably suggests one having ordinary skill in the art, a structure of a work vehicle in which two tank modules are disposed on a rear of both lateral sides of the work vehicle to form a cooling module recess therebetween. Thus, a combination of the applied prior art cannot render claim 44 obvious, which requires a first tank module disposed on a rear of a first side of the bulldozer and a second tank module disposed on a rear of a second side of the bulldozer with the rear end of the cooling module being disposed forward of rear ends of the first and second tank modules. When determining whether a claim is obvious, an examiner must make "a searching comparison of the claimed invention – ***including all its limitations*** – with the teaching of the prior art." *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, "obviousness requires a suggestion of all limitations in a claim." *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (*citing In re Royka*, 490 F.2d 981, 985 (CCPA 1974)). Accordingly, claim 44 is not rendered obvious over the applied prior art.

None Of The Applied Prior Art Shows "Cooling Module Recess" and Arrangement of Cooling Module with respect to First and Second Tank Modules

The Office Action apparently relies on the Akashima et al. patent to allegedly show the rearwardly extending tanks. In other words, the Office Action appears to assert one having ordinary skill in the art would have ***completely disregarded*** an existing arrangement of the tanks in the Figure 1 bulldozer when combining the teaching of the Pack patent regarding the arrangement of the cooling module, and once the cab is shifted forward "to account for an imbalance", the tanks are conveniently rearranged in view of the Akashima et al. patent to accommodate the new cooling module arrangement. However, as discussed above in relation to claim 19, Appellants respectfully assert the logic employed by the Office Action with respect to combination of the Akashima et al. patent is seriously flawed in that it would be ***impossible*** to account for an imbalance or to even recognize any imbalance in the vehicle when large components such as the tanks are completely disregarded. Appellants respectfully assert one having ordinary skill in the art would not have completely ignored the existing arrangement of the tank in the Figure 1 bulldozer if the one were to combine the teaching of the Pack patent to the Figure 1 bulldozer. Please refer to the detailed discussion with respect to independent claim 19.

Present Case Exhibits Strong Showing Of Objective Evidence Of Nonobviousness

Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness by the documents A-E as discussed above.

In view of the above, the arrangement recited in independent claim 44 is not rendered obvious over the Figure 1 bulldozer, the Pack patent and the Akashima et al. patent, whether taken singularly or in combination.

Moreover, Appellants believe that dependent claims 45-48 are also allowable over the applied prior art in that they depend from independent claim 44, and therefore, are allowable for the reasons stated above. Also, dependent claims 45-48 are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claim 44, the applied prior art also fails to disclose or suggest the bulldozer as set forth in dependent claims 45-48.

(B) REJECTION UNDER 35 U.S.C. §103(a) OVER THE FIGURE 1 BULLDOZER IN VIEW OF THE PACK PATENT AND THE AKASHIMA ET AL. PATENT, AND FURTHER IN VIEW OF THE SHEIDLER ET AL. PATENT

Claims 22 and 42

Claims 22 and 42 stand rejected as being obvious over the Figure 1 bulldozer in view of the Pack patent and the Akashima et al. patent, and further in view of the Sheidler et al. patent. The Sheilder et al. patent were apparently cited in the Office Action to allegedly show a radiator core having a charged air cooling unit, an oil cooling unit and a water cooling unit, and a fan for moving air through the radiator as recited in dependent claims 22 and 42. However, the Sheilder et al. patent fails to provide for the above discussed deficiencies of the Figure 1 bulldozer, the Pack patent and the Akashima et al. patent with respect to independent claims 19 and 35. Therefore, independent claims 19 and 35 are not rendered obvious over the Figure 1 bulldozer, the Pack patent, the Akashima et al. patent, and the Sheidler et al. patent whether taken singularly or in combination.

Appellants believe that dependent claims 22 and 42 are also allowable over the applied prior art in that they depend from independent claim 19 or 35, and therefore, are allowable for the reasons stated above. Also, dependent claims 22 and 42 are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claims 19 and 35, the applied prior art also fails to disclose or suggest the bulldozer as set forth in dependent claims 22 and 42.

(C) REJECTION UNDER 35 U.S.C. §103(a) OVER THE YOSHIDA PUBLICATION IN VIEW OF THE FIGURE 1 BULLDOZER AND FURTHER IN VIEW OF THE AKASHIMA ET AL. PATENT

Claims 19, 20, 21, 24, 30, 32, 33 and 34

It Is An Error To Assert The Yoshida Publication Discloses A Bulldozer Blade

The Office Action asserts the Yoshida publication discloses a bulldozer and interprets a bucket 2 of the Yoshida publication as corresponding to a bulldozer blade.

However, a work vehicle disclosed in the Yoshida publication is a so-called "track loader", which is equipped with a bucket instead of a bulldozer blade. As discussed in the Mukaino's third Declaration, unlike a bulldozer blade whose main function is to push material, a bucket of the track loader is usually used for picking and loading material, and the bucket filled with material is moved up and down during loading operation. In other words, the track loader requires a different performance expected from a bulldozer, and the design object for a track loader disclosed in the Yoshida publication is completely different from that of a bulldozer. Thus, one having ordinary skill in the art would have known that the ***bucket*** 2 shown in the Yoshida publication does ***not*** correspond to a bulldozer blade. Thus, the Yoshida publication does not disclose a bulldozer having a ***bulldozer blade*** as recited in independent claim 19.

Accordingly, combining the teachings of the Yoshida publication and the Figure 1 bulldozer in a manner asserted in the Office Action would not produce a bulldozer having a bulldozer blade as recited in independent claim 19.

Yoshida Publication's Teaching Undermines Alleged Reason To Combine

The Office Action asserts it would have been obvious to shift the cab in the Yoshida publication forward in view of the teaching of the Figure 1 bulldozer, in which all of the elements of the bulldozer except for the blade components are contained such that they do not overhang the tracks. Appellants respectfully assert one of ordinary skill in the art would ***not*** have considered it obvious to shift the operator's seat in the Yoshida publication as asserted by the Office Action because the teaching of the Yoshida publication undermines the alleged reason to combine the references (i.e., "so that the rearward positioned cooling module does not overhang the tracks"). An inference of nonobviousness is especially strong where the prior art's teachings undermine the very reason being proffered as to why a person of ordinary skill would have combined the known elements. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 90 USPQ2d 1865 at 1873 (Fed. Cir. 2009)

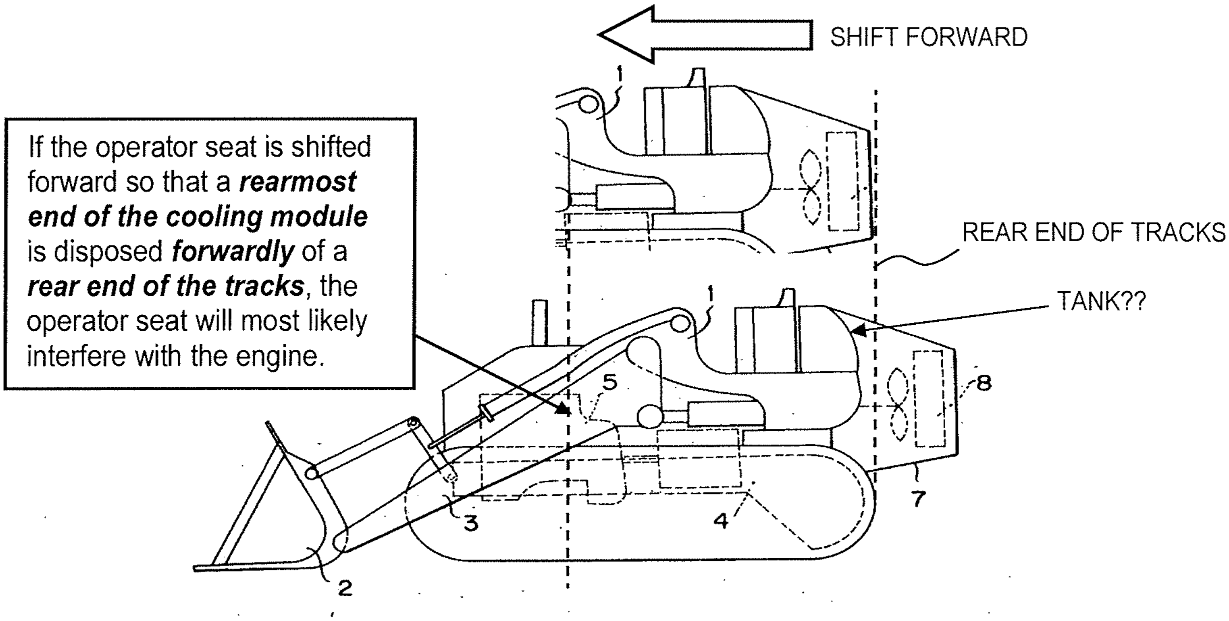
As discussed above, a work vehicle disclosed in the Yoshida publication is a so-called "track loader", which is equipped with a ***bucket*** instead of a bulldozer blade. As discussed in the Mukaino's third Declaration, unlike a bulldozer blade whose main function is to push material, a bucket of the track loader is usually used for picking and loading material, and the bucket filled with material is moved up and down during loading operation. The Yoshida publication specifically teaches that, ***in order to counterbalance load imparted on the bucket*** during loading operation, the radiator and the fan are placed on the rear side of the operator seat so that ***the center of gravity of the vehicle is placed toward the rear side*** (see, lines 9-11 on page 2 of the Yoshida publication). In other words, the Yoshida publication teaches to place the radiator and the fan at the rearmost position of the track loader in order to place the center of gravity toward the rear side. On the other hand, in general, a position of the center of gravity of a bulldozer body (such as the Figure 1 bulldozer) is preferably set toward a front portion of the bulldozer as discussed in the Mukaino's third Declaration. Therefore, the alleged reason to combine (i.e., the rearward positioned cooling module does not overhang the tracks) as asserted by the Office Action runs contrary to the Yoshida publication that teaches to place the center of gravity toward the rear side by arranging the radiator and the fan on the rear side of the vehicle. Thus, Appellants respectfully assert the Yoshida publication teaches away from the proposed combination such that a person ordinary skilled in the art would have been deterred from combining the references as proposed by the Office Action.

None Of The Applied Prior Art Shows "Cooling Module Recess" and Arrangement of Cooling Module with respect to First Tank Module and Tracks

Assuming for the sake of argument that the Yoshida publication and the Figure 1 bulldozer were combinable as asserted by the Office Action, which is not true, the hypothetical combination of the references would still ***fail*** to disclose or suggest the arrangement of the bulldozer as recited in independent claim 19.

More specifically, independent claim 19 recites the tracks extend rearwardly of the rear end of the vehicle frame ***to form a cooling module recess*** that is disposed laterally ***between the tracks*** and at a rear end portion of the frame along the center longitudinal axis. Moreover, independent claim 19 further recites at least ***an upper end of the cooling module*** is ***recessed forwardly*** from a rear end of the ***first tank module*** that is disposed on a rear of a first ***lateral side*** of the bulldozer, and a ***rearmost end of the cooling module*** is disposed ***forwardly*** of a ***rear end of the tracks***. Clearly, ***none*** of the Yoshida publication, the Figure 1 bulldozer and the Akashima et al. patent discloses or suggests this ***cooling module recess***. The Office Action asserts it would have been obvious to shift the cab forward in the Yoshida publication so that the rearward positioned cooling module does not overhang the tracks thereby protecting it from damage during operation. However, the Yoshida publication discloses a structure in which the rearward positioned cooling module overhangs the tracks, and the cooling module is protected by the cover member surrounding the cooling module. Appellants respectfully assert ***nothing*** in the applied prior art suggests shifting the cab forward to protect the cooling module. Accordingly, Appellants respectfully assert the conclusion of obviousness that one would have shifted the cab forward to protect the cooling module is based on improper hindsight reasoning.

Moreover, Figure 1 of the Yoshida publication shows no space between the operator seat and the engine in the engine compartment to allow the operator seat move forward by such a distance that a ***rearmost end of the cooling module*** is disposed ***forwardly*** of a ***rear end of the tracks*** (please see the annotated version of Figure 1 of the Yoshida publication as reproduced below). Therefore, Appellants believe one having ordinary skill in the art would ***not*** have considered it obvious to shift the cab forward to obtain the arrangement as recited in independent claim 19.



If the operator seat is shifted forward so that a ***rearmost end of the cooling module*** is disposed ***forwardly*** of a ***rear end of the tracks***, the operator seat will most likely interfere with the engine.

Furthermore, Appellants respectfully assert although it is not completely clear from the limited disclosure of the Yoshida publication, the Yoshida publication at best understood discloses a tank that extends laterally on the rear side of the operator's seat in a similar manner as the Figure 1 bulldozer. Therefore, the combination of the Yoshida publication and the Figure 1 bulldozer at best understood only discloses that the cooling module is disposed ***behind*** the tank (i.e., the tank is interposed between the operator's seat and the cooling module). Thus, the cooling module would be placed ***rearward*** of the tank. The Office Action appears to assert the Akashima et al. patent shows an arrangement of a tank disposed on either side of a work vehicle. However, the Office Action fails to provide an articulated reasoning as to why one having ordinary skill in the art would have completely disregarded the existing arrangement of the tank in the Yoshida publication and the Figure 1 bulldozer, and then conveniently rearrange a tank on a lateral side of the work vehicle in view of the Akashima et al. patent to obtain the claimed arrangement.

Accordingly, Appellants respectfully assert the Office Action's conclusion of obviousness has no factual basis and is based on improper hindsight reasoning.

Present Case Exhibits Strong Showing Of Objective Evidence Of Nonobviousness

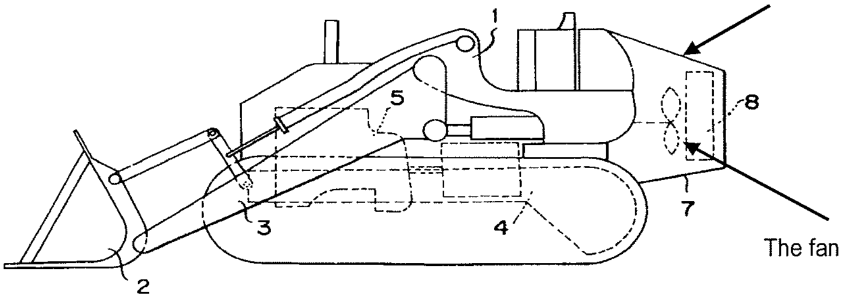
Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness by the documents A-E as discussed above.

Claim 23

Claim 23 states the cooling module is mounted behind the cab such that a ***plane of the fan slopes downward*** towards the rear of the bulldozer. Appellants respectfully assert such a specific orientation of the fan of the cooling module is ***not*** disclosed or suggested by the Yoshida publication, the Figure 1 bulldozer or the Akashima et al. patent.

The Office Action refers to a part of the cover 7 shown in Figure 1 of the Yoshida publication to allegedly show the limitation of claim 23. However, the Yoshida publication clearly shows in Figure 1 that the plane of the fan extends vertically, and thus, the Yoshida publication ***fails*** to disclose or suggest the plane of the fan ***slopes downward*** towards the rear as recited in claim 23. Thus, claim 23 is not rendered obvious over the applied prior art.

This is clearly ***not*** a plane of the fan.



The fan is disposed vertically.

Claim 29

Claim 29 recites the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module***. In rejection of this claim, the Office Action only provides a conclusory statement that "the combination discloses the cooling module is capable of being completely recessed forwardly from the rear ends of the first and second tanks". Appellants respectfully disagree with this assertion of the Office Action.

More specifically, there is ***nothing*** in the applied prior art that suggests the cooling module is arranged with respect to the first tank module so that the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module.*** As discussed above, one having ordinary skilled in the art would reasonably ascertain that the tank extends laterally ***behind*** the operator's seat in the combination of the Yoshida publication and the Figure 1 bulldozer. As shown in the Yoshida publication at best understood, the cooling module is placed behind the fuel tank. Thus, the cooling module would be placed ***rearward*** of the tank even if the Yoshida publication and the Figure 1 bulldozer were combined. The Office Action appears to assert the Akashima et al. patent shows an arrangement of a tank disposed on either side of a work vehicle. However, the Office Action ***fails*** to provide an articulated reasoning as to why one having ordinary skill in the art would have completely disregarded the existing arrangement of the tank in the Yoshida publication and the Figure 1 bulldozer, and then, conveniently rearrange a tank on a lateral side of the work vehicle in view of the Akashima et al. patent to obtain the claimed arrangement.

Moreover, even if the combination with the Akashima et al. patent were possible, which is certainly not true, nothing in the applied prior art teaches arranging the cooling module in such a position that the cooling module is ***completely recessed*** forwardly from the rear end of the ***first tank module.***

Accordingly, claim 29 is not rendered obvious over the applied prior art.

Claim 35, 37, 41 and 43

Independent claim 35 is directed to a bulldozer having similar structures recited in independent claim 19, except that independent claim 35 does not include the limitation relating to the first tank module, and the independent claim 35 defines spacial relationship between the top sloped surface of the engine cover and the bulldozer blade.

The similar arguments supporting nonobviousness as asserted in relation to independent claim 19 apply to independent claim 35. More specifically, Appellants believe combining the teachings of the Yoshida publication and the Figure 1 bulldozer in a manner asserted in the Office Action would not produce a bulldozer having a bulldozer blade as recited in independent claim 19 because the Yoshida publication does not disclose a bulldozer with a bulldozer blade. Also, one of ordinary skill in the art would ***not*** have considered it obvious to shift the operator's seat in the Yoshida publication as asserted by the Office Action because the teaching of the Yoshida publication undermines the alleged reason to combine the references (i.e., "so that the rearward positioned cooling module does not overhang the tracks"). Moreover, assuming for the sake of argument that the Yoshida publication and the Figure 1 bulldozer were combinable as asserted by the Office Action, which is not true, the hypothetical combination of the references would still ***fail*** to disclose or suggest the arrangement recited in claim 35. More specifically, Figure 1 of the Yoshida publication shows no space between the operator seat and the engine in the engine compartment to allow the operator seat move forward by such a distance that a ***rearmost end***

of the cooling module is disposed ***forwardly*** of a ***rear end of the tracks*** (please see the annotated version of Figure 1 of the Yoshida publication as reproduced above). Therefore, Appellants believe one having ordinary skill in the art would ***not*** have considered it obvious to shift the cab forward to obtain the arrangement as recited in independent claim 35. Furthermore, Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness by the documents A-E of record, as discussed above.

Accordingly, Appellants believe independent claim 35 is allowable over the applied prior art.

Appellants believe that dependent claims 37, 41 and 43 are also allowable over the applied prior art in that they depend from independent claim 35, and therefore, are allowable for the reasons stated above. Also, the dependent claims are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claim 35, the applied prior art also fails to disclose or suggest the bulldozer as set forth in the dependent claims 37, 41 and 43.

Claim 38

Claim 38 recites a first tank module disposed on a rear of a first side of the bulldozer, with a rear end of the cooling module being disposed forward of a rear end of the first tank module. This limitation is substantially the same as the limitation relating to the first tank module recited in independent claim 19. As discussed above in relation to claim 19, Appellants believe the specific arrangement of the cooling module that is disposed forward of a rear end of the first tank module cannot be rendered obvious by the combination of the Yoshida publication, the Figure 1 bulldozer, and the Akashima et al. patent. Accordingly, Appellants believe claim 38 is allowable over the applied prior art.

Claims 39 and 40

Claim 39 depends from claim 38 and recites a second tank module disposed on a rear of a second side of the bulldozer, with the rear end of the cooling module being disposed forward of a rear end of the second tank module. Thus, claim 39 requires a first tank module disposed on a rear of a first side of the bulldozer and a second tank module disposed on a rear of a second side of the bulldozer with the rear end of the cooling module being disposed forward of rear ends of the first and second tank modules. This limitation is the same as the limitation in claim 44 relating to the first and second tank modules. Thus, the same arguments asserted regarding the limitations of the first and second fuel tanks in claim 44, discussed in more detail below, apply to the limitations recited in claim 39. Accordingly, Appellants believe claim 39 is allowable over the applied prior art.

Appellants believe that dependent claim 40 is also allowable over the applied prior art in that this claim depends from claim 39, and therefore, is allowable for the reasons stated above. Also, dependent claim 40 is further allowable because it includes additional limitation. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in claim 39, the applied prior art also fails to disclose or suggest the bulldozer as set forth in the dependent claim 40.

Claim 44-48

Independent claim 44 is directed to a bulldozer having similar structures recited in independent claim 19, except that independent claim 44 does not require a cooling module recess being formed between the tracks, but instead independent claim 44 further recites a second tank module disposed on a rear of a second side of the bulldozer with a ***cooling module recess*** being formed laterally ***between the first and second tank modules*** at a rear end portion of the frame along the center longitudinal axis. Moreover, claim 44 also recites the rearmost end of the cooling module is ***recessed forwardly*** from ***rear ends of***

the first and second tank modules. Clearly, this unique arrangement of the bulldozer is neither disclosed nor suggested by the applied prior art, whether taken singularly or in combination.

It Is An Error To Assert The Yoshida Publication Discloses A Bulldozer Blade

As discussed above with respect to the rejection to claim 19, a work vehicle disclosed in the Yoshida publication is a so-called "track loader", which is equipped with a bucket instead of a bulldozer blade. Thus, the Yoshida publication does not disclose a bulldozer having a ***bulldozer blade*** as recited in independent claim 44. Accordingly, combination of the Yoshida publication and the Figure 1 bulldozer as asserted in the Office Action would not produce a bulldozer having a bulldozer blade as recited in independent claim 44.

None of Prior Art References of Record Discloses a Cooling Module Recess Formed By Two Tank Modules Disposed On Rear of Both Lateral Sides of a Bulldozer

The Office Action apparently relies on the Akashima et al. patent to show two tank modules on a rear of both lateral sides of a work vehicle to form a cooling module recess therebetween as recited in independent claim 44.

However, as discussed above with respect to the rejection to claim 44 over the Figure 1 bulldozer in view of the Pack patent and the Akashima et al. patent, ***neither*** the Akashima patent ***nor*** the Figure 1 bulldozer discloses or suggests ***two tank modules*** on a rear of both ***lateral sides*** of a work vehicle. Accordingly, ***none*** of the applied prior art discloses, or reasonably suggests one having ordinary skill in the art a structure of a work vehicle in which two tank modules are disposed on a rear of both lateral sides of the work vehicle to form a ***cooling module recess*** therebetween. Thus, a combination of the applied prior art cannot render claim 44 obvious, which requires a first tank module disposed on a rear of a first side of the bulldozer and a second tank module disposed on a rear of a second side of the bulldozer with the rear end of the cooling module being disposed forward of rear ends of the first and second tank modules.

Yoshida Publication's Teaching Undermines Alleged Reason To Combine

As discussed above with respect to the rejection to claim 19, Appellants respectfully assert one of ordinary skill in the art would ***not*** have considered it obvious to shift the operator's seat in the Yoshida publication forward so that the rearward positioned cooling module does not overhang the tracks as asserted by the Office Action because the teaching of the Yoshida publication undermines this alleged reason for combining the references. Thus, Appellants respectfully assert the Yoshida publication teaches away from the proposed combination such that a person ordinary skilled in the art would have been deterred from combining the references as proposed by the Office Action.

None Of The Applied Prior Art Shows "Cooling Module Recess" and Arrangement of Cooling Module with respect to First and Second Tank Modules

As discussed above with respect to the rejection to claim 19, Appellants respectfully assert ***none*** of the Yoshida publication, the Figure 1 bulldozer and the Akashima et al. patent discloses or suggests shifting the cab of the Yoshida publication forward to form the ***cooling module recess between the first and second tank modules***. Moreover, Figure 1 of the Yoshida publication shows no space between the operator seat and the engine in the engine compartment to allow the operator seat move forward by such a distance that a ***rearmost end of the cooling module*** is disposed ***forwardly*** of a ***rear end of the tracks*** (please see the annotated version of Figure 1 of the Yoshida publication as reproduced above with respect to the rejection to claim 19). Therefore, Appellants believe one having ordinary skill in the art would ***not*** have considered it obvious to shift the cab forward to obtain the arrangement as recited in independent claim 44.

Present Case Exhibits Strong Showing Of Objective Evidence Of Nonobviousness

Appellants respectfully assert the present case exhibits strong showing of objective evidence of nonobviousness by the documents A-E as discussed above.

Moreover, Appellants believe that dependent claims 45-48 are also allowable over the applied prior art in that they depend from independent claim 44, and therefore, are allowable for the reasons stated above. Also, dependent claims 45-48 are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claim 44, the applied prior art also fails to disclose or suggest the bulldozer as set forth in dependent claims 45-48.

(D) REJECTION UNDER 35 U.S.C. §103(a) OVER THE YOSHIDA PUBLICATION IN VIEW OF THE FIGURE 1 BULLDOZER AND THE AKASHIMA ET AL. PATENT AND FURTHER IN VIEW OF THE SHEIDLER ET AL. PATENT

Claims 22 and 42

Claims 22 and 42 stand rejected as being obvious over the Yoshida publication in view of the Figure 1 bulldozer and the Akashima et al. patent, and further in view of the Sheidler et al. patent. The Sheilder et al. patent were apparently cited in the Office Action to allegedly show a radiator core having a charged air cooling unit, an oil cooling unit and a water cooling unit, and a fan for moving air through the radiator as recited in dependent claims 22 and 42. However, the Sheilder et al. patent fails to provide for the above discussed deficiencies of the Yoshida publication, the Figure 1 bulldozer and the Akashima et al. patent with respect to independent claims 19 and 35. Therefore, independent claims 19 and 35 are not rendered obvious over the Yoshida publication, the Figure 1 bulldozer, the Akashima et al. patent, and the Sheidler et al. patent whether taken singularly or in combination.

Appellants believe that dependent claims 22 and 42 are also allowable over the applied prior art in that they depend from independent claim 19 or 35, and therefore, are allowable for the reasons stated above. Also, dependent claims 22 and 42 are further allowable because they include additional limitations. Appellants believe that since the applied prior art does not disclose or suggest the bulldozer as set forth in independent claims 19 and 35, the applied prior art also fails to disclose or suggest the bulldozer as set forth in dependent claims 22 and 42.

8. *Conclusion*

In view of the above analysis of claims 19-26, 29, 30, 32-35 and 37-48, Appellants believe that claims 19-26, 29, 30, 32-35 and 37-48 are not rendered obvious by the combinations of the applied prior art.

Thus, Appellants respectfully request that the rejections of these claims be reversed and that claims 19-26, 29, 30, 32-35 and 37-48 be allowed. If there are any questions regarding this Brief, please feel free to contact the undersigned.

Respectfully submitted,

/David L. Tarnoff/
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Reg. No. 32,383

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A- Claims Appendix

19. A bulldozer comprising:

a vehicle frame having a front end and a rear end with a center longitudinal axis;

a pair of tracks disposed on left and right sides of the center longitudinal axis of the bulldozer, respectively, for supporting the vehicle frame, with the tracks extending rearwardly of the rear end of the vehicle frame to form a cooling module recess that is disposed laterally between the tracks and at a rear end portion of the frame along the center longitudinal axis;

a forwardly positioned operator seat secured to the vehicle frame at a location between the front and rear ends in front of the cooling module recess;

a bulldozer blade disposed in front of the front end of the vehicle frame and operatively coupled to the vehicle frame, the bulldozer blade including a top center portion disposed along the center longitudinal axis of the bulldozer;

a front mounted engine disposed at a front portion on the vehicle frame along the center longitudinal axis of the bulldozer that is in front of the operator seat and behind the bulldozer blade;

an engine cover covering the front mounted engine at the front portion of the vehicle frame, the engine cover being downwardly angled towards the bulldozer blade along the center longitudinal axis of the bulldozer and aligned vertically above the front mounted engine, the operator seat, the engine cover and the bulldozer blade being disposed such that, when a lowest point of the bulldozer blade and a lowest point of the tracks are generally on a horizontal plane, the top center portion of the bulldozer blade is visible over a top sloped surface of the engine cover;

a first tank module disposed on a rear of a first lateral side of the bulldozer; and

a cooling module fluidly coupled to the front mounted engine for cooling the front mounted engine, the cooling module being coupled to the rear end portion of the vehicle frame within the cooling module recess formed between the tracks, at least an upper end of the cooling module being recessed forwardly from a rear end of the first tank module, and a rearmost end of the cooling module being disposed forwardly of a rear end of the tracks.

20. The bulldozer as claimed in claim 19, wherein

a roof coupled to the vehicle frame and vertically disposed directly above the operator seat.

21. The bulldozer as claimed in claim 19, further comprising:

an operator cab secured to the frame behind the engine cover and surrounding the operator seat.

22. The bulldozer as claimed in claim 19, wherein

the cooling module includes a radiator core having a charged air cooling unit, an oil cooling unit and a water cooling unit, and a fan for moving air through the radiator.

23. The bulldozer as claimed in claim 21, wherein

the cooling module includes a radiator and a fan for moving air through the radiator, and the cooling module is mounted behind the cab such that a plane of the fan slopes downward towards the rear of the bulldozer.

24. The bulldozer as claimed in claim 19, wherein

the tracks are part of track frame modules that are attached to the vehicle frame.

25. The bulldozer as claimed in claim 45, wherein

the rear end of the cooling module is recessed forwardly from the rear ends of the first and second tank modules so that a rearward line of sight is formed from the eye point above the operator seat to ground that passes between the first and second tank modules as viewed in a direction perpendicular to a vertical plane passing through the center longitudinal axis of the vehicle frame.

26. The bulldozer as claimed in claim 45, wherein

the second tank module includes a tank fluidly coupled to the bulldozer blade for supplying hydraulic fluid to the bulldozer blade and the first tank module includes a tank fluidly coupled to the front mounted engine for supplying fuel to the front mounted engine.

29. The bulldozer as claimed in claim 19, wherein

the cooling module is completely recessed forwardly from the rear end of the first tank module.

30. The bulldozer as claimed in claim 19, wherein

the first tank module includes a tank fluidly coupled to the front mounted engine for supplying fuel to the front mounted engine.

32. The bulldozer as claimed in claim 19, wherein

the front mounted engine is disposed at least partially above an uppermost edge of the tracks.

33. The bulldozer as claimed in claim 32, wherein

the cooling module is completely recessed forwardly from the rear end of the first tank module.

34. The bulldozer as claimed in claim 19, wherein

the engine cover is generally closed.

35. A bulldozer comprising:

a vehicle frame having a front end and a rear end with a center longitudinal axis;

a pair of tracks extending in a forward-to-aft direction on left and right sides of the center longitudinal axis of the bulldozer, respectively, for supporting the vehicle frame, with the tracks extending rearwardly of the rear end of the vehicle frame to form a cooling module recess that is disposed laterally between the tracks and at a rear end portion of the frame along the center longitudinal axis;

a front mounted engine supported on a front portion of the vehicle frame at a location along the center longitudinal axis of the bulldozer;

a cooling module fluidly coupled to the front mounted engine for cooling the front mounted engine, the cooling module arranged at the rear end portion of the vehicle frame within the cooling module recess formed between the tracks such that a rearmost end of the cooling module is disposed forwardly of a rear end of the tracks;

a forwardly positioned operator seat secured to the vehicle frame at a location behind the front mounted engine and in front of the cooling module recess;

a moveable bulldozer blade disposed in front of the front end of the vehicle frame; and

an engine cover coupled to the vehicle frame and covering the front mounted engine, with the engine cover having a top sloped surface extending along the center longitudinal axis of the bulldozer and aligned vertically above the front mounted engine such that the top sloped surface of the engine cover is downwardly angled towards the bulldozer blade along the center longitudinal axis of the bulldozer,

the top sloped surface of the engine cover and the bulldozer blade being disposed with respect to each other such that a line extending on and forwardly from the top sloped surface of the engine cover intersects with a top center portion of the bulldozer blade when the bulldozer blade is placed on the ground.

37. The bulldozer as claimed in claim 35, wherein

the front mounted engine is disposed at least partially above an uppermost edge of the tracks.

38. The work vehicle as claimed in claim 35, further comprising:

a first tank module disposed on a rear of a first side of the bulldozer, with a rear end of the cooling module being disposed forward of a rear end of the first tank module.

39. The bulldozer as claimed in claim 38, further comprising:

a second tank module disposed on a rear of a second side of the bulldozer, with the rear end of the cooling module being disposed forward of a rear end of the second tank module.

40. The bulldozer as claimed in claim 39, wherein

the second tank module is for supplying hydraulic fluid to the bulldozer blade and the first tank module is for supplying fuel to the front mounted engine.

41. The bulldozer as claimed in claim 35, further comprising:

a roof coupled to the vehicle frame and vertically disposed directly above the operator seat, with an eye point located between the roof and the operator seat in which the top center portion of the bulldozer blade is visible from the eye point over the top sloped surface.

42. The bulldozer as claimed in claim 35, wherein

the cooling module includes a radiator core having a charged air cooling unit, an oil cooling unit and a water cooling unit, and a fan adjacent the radiator core.

43. The bulldozer as claimed in claim 35, further comprising:

an operator cab secured to the frame behind the engine cover, such that the operator seat and an eye point are located in the cab in which the top center portion of the bulldozer blade is visible from the eye point over the top sloped surface.

44. A bulldozer comprising:

a vehicle frame having a front end and a rear end with a center longitudinal axis;

a pair of tracks disposed on left and right sides of the center longitudinal axis of the bulldozer, respectively, for supporting the vehicle frame, with the tracks extending rearwardly of the rear end of the vehicle frame;

a forwardly positioned operator seat secured to the vehicle frame at a location between the front and rear ends;

a bulldozer blade disposed in front of the front end of the vehicle frame and operatively coupled to the vehicle frame, the bulldozer blade including a top center portion disposed along the center longitudinal axis of the bulldozer;

a front mounted engine disposed at a front portion on the vehicle frame along the center longitudinal axis of the bulldozer in front of the operator seat and behind the bulldozer blade;

an engine cover covering the front mounted engine, with the engine cover having a top sloped surface extending along the center longitudinal axis of the bulldozer and aligned vertically above the front mounted engine such that the top sloped surface of the engine cover is downwardly angled towards the bulldozer blade along the center longitudinal axis of the bulldozer, the top sloped surface of the engine cover and the bulldozer blade being disposed with respect to each other such that a line extending on and forwardly from the top sloped surface of the engine cover intersects with a top center portion of the bulldozer blade when the bulldozer blade is placed on the ground;

a first tank module disposed on a rear of a first lateral side of the bulldozer;

a second tank module disposed on a rear of a second lateral side of the bulldozer with a cooling module recess being formed laterally between the first and second tank modules at a rear end portion of the frame along the center longitudinal axis; and

a cooling module fluidly coupled to the front mounted engine for cooling the front mounted engine, the cooling module being coupled to the rear end portion of the vehicle frame within the cooling module recess with a rearmost end of the cooling module being recessed forwardly from rear ends of the first and second tank modules.

45. The bulldozer as claimed in claim 44, wherein

the cooling module includes a radiator and a fan for moving air through the radiator, with at least an upper end of a rear side of the cooling module is positioned forward with respect to a lower end of the rear side of the cooling module.

46. The bulldozer as claimed in claim 44, further comprising

an operator cab surrounding the operator seat, the operator cab being disposed between the first and second tank modules and secured to the vehicle frame behind the engine cover, the operator cab including an opening for allowing an operator to get in and out of the operator cab with the opening being disposed on a side one of the first and second tank modules is arranged, a front end of the one of the first and second tank modules being disposed rearwardly of a rear end of the opening and the rear end of the one of the first and second tank modules being disposed rearward of a rear surface of the operator cab,

the cooling module being disposed rearward of the operator cab.

47. The bulldozer as claimed in claim 46, wherein

the operator cab includes a rear window disposed on the rear surface of the operator cab with a bottom end of the rear window being arranged above a top end of the cooling module.

48. The bulldozer as claimed in claim 46, wherein

the cooling module is mounted in the cooling module recess so that a rear side of the cooling module is exposed.

B- Evidence Appendix

Appellants are relying on the following additional evidence in this appeal of the above-identified patent application:

1. Declaration of Masayuki Mukaino filed under 37 CFR §1.132 on July 28, 2008 (first Declaration), submitted together with an Amendment after the Non-Final Office Action of January 30, 2008. The first Declaration of Masayuki Mukaino was entered and considered by the Examiner as discussed in the Office Action of October 3, 2008.

2. A copy of the article "Rave Review for Komatsu's D51" appeared on CONSTRUCTION EQUIPMENT website, submitted on July 28, 2008 as objective evidence of nonobviousness together with an Amendment after the Non-Final Office Action of January 30, 2008. The objective evidence was entered and considered by the Examiner as discussed in the Office Action of October 3, 2008.

3. A copy of the article "Top 100 New Products of 2007" in December 2007 issue of CONSTRUCTION EQUIPMENT, submitted on July 28, 2008 as objective evidence of nonobviousness together with an Amendment after the Non-Final Office Action of January 30, 2008. The objective evidence was entered and considered by the Examiner as discussed in the Office Action of October 3, 2008.

4. A copy of the press release on July 18, 2008 and printout copies of related pages in the IDEA International Design Excellence Awards '08 official website, submitted on August 11, 2008 as objective evidence of nonobviousness. The objective evidence was

entered and considered by the Examiner as discussed in the Office Action of October 3, 2008.

5. Declaration of Masayuki Mukaino filed under 37 CFR §1.132 on February 24, 2009 (second Declaration), submitted together with an Amendment after the Final Office Action of October 3, 2008. The second Declaration of Masayuki Mukaino was entered and considered by the Examiner as discussed in the Office Action of April 29, 2009.

6. A copy of the article “High visibility grunt” in January 2009 issue of EARTHMOVERS, submitted on February 24, 2009 as objective evidence of nonobviousness together with an Amendment after the Final Office Action of October 3, 2008. The objective evidence was entered and considered by the Examiner as discussed in the Office Action of April 29, 2009.

7. A copy of Komatsu D51EX-22/D51PX-22 Crawler Dozer Catalog, submitted on February 24, 2009 as objective evidence of nonobviousness together with an Amendment after the Final Office Action of October 3, 2008. The objective evidence was entered and considered by the Examiner as discussed in the Office Action of April 29, 2009.

8. Declaration of Masayuki Mukaino filed under 37 CFR §1.132 on July 1, 2010 (third Declaration), submitted together with an Amendment after the Final Office Action of March 11, 2010. The third Declaration of Masayuki Mukaino was entered and considered by the Examiner as discussed in the Advisory Action of July 22, 2010.

C- Related Proceeding Appendix

None: Since Appellants are not aware of any appeals or interferences relating to the above-identified patent application, there are no decisions rendered by a court or the Board that are required to be submitted herewith.

Evidence Appendix 1

PATENT

KL-US050678

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	***Confirmation No. 7520***
Kazumasa Fukazawa et al.	:	
Serial No. 10/681,253	:	
Filed: October 9, 2003	:	
For: BULLDOZER WITH IMPROVED VISIBILITY (As Amended)	:	

DECLARATION OF MASAYUKI MUKAINO UNDER 37 CFR §1.132

I, Masayuki Mukaino, pursuant to 37 CFR §1.132, hereby declare:

1. I am a co-inventor of the invention disclosed in the above-identified application.

2. I am currently a general manager of Small Size Machine Development Group of Komatsu Ltd in Japan. I have been working as an engineer in the construction equipment manufacturing field for the past 27 years. Therefore, I believe I possess experience, skill and knowledge of what one of ordinary skill in the construction equipment manufacturing field would possess.

3. In my professional point of view, when designing a vehicle body and structural layout for a bulldozer, one would ***not*** look into patent documents related to a truck because the arrangement and structure of the vehicle body in a bulldozer is ***completely different*** from those of the vehicle body in a truck.

4. In the conventional bulldozers (e.g., the bulldozer shown in Figure 1 of the present application), the cooling fan of the radiator was directly connected to the engine, and thus, the cooling fan and the radiator could not be disposed far away from the engine. Moreover, even if the cooling fan and the radiator were somehow separated from the engine, one would not consider placing the cooling module behind the cab because there is usually no space in the rear portion of the vehicle frame. In other words, the rear portion of the vehicle frame of the conventional bulldozer is usually occupied by structural elements such as the transmission and the gear train for the steering system. Therefore, one of ordinary skill in the art would not take an arrangement specifically

designed for a truck (e.g., U.S. Patent No. 6,793,028 to Pack, hereinafter "Pack patent") and apply it to a conventional bulldozer, because placing the cooling module in the rear portion of the vehicle is not physically practical in the conventional bulldozer.

5. For the sake of argument, if the cooling fan and the radiator of a conventional bulldozer such as the one shown in Figure 1 of the present application were merely placed in the rear portion of the bulldozer without further modifications, then the operator would still not be able to see the center of the blade. In our new design, the position of the operator's seat and cab are moved forwardly to: (1) create a cooling module recess between the track shoes for receiving the cooling fan and the radiator; and (2) provide the proper advantage point to see the center of the blade from the operator's seat.

6. To my knowledge, the arrangement of the cooling module (i.e., moving the cooling module behind the cab) disclosed in the Pack patent has never been applied to any model of the Caterpillar's bulldozers since the patent application matured in the Pack patent was filed in May, 1999.

7. To my knowledge, none of the bulldozer manufactures has adapted the arrangement of the cooling module (i.e., moving the cooling module behind the cab) disclosed in the Pack patent in the bulldozers since the application matured in the Pack patent was first published in May 2002.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

/Masayuki Mukaino/
Masayuki Mukaino

Dated: July 27, 2008

Evidence Appendix 2

EXHIBIT A

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Rave Review for Komatsu's D51

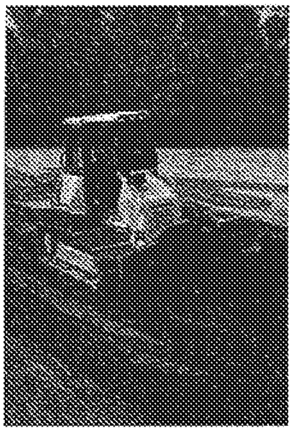
After half a day on this new dozer, professional operator Jim Schultheis came away impressed with its power, controllability and operator amenities

August 1, 2007

By Walt Moore, Senior Editor

When Jim Schultheis shows up on a jobsite, chances are that the superintendent will shift people and machines around to get him on a grading tractor. After 40 years as a professional operator, he can competently run any machine you give him, but his reputation on a finishing dozer usually precedes him to the site.

"It must be in the genes," he says, "considering that both my father and uncle were finish hands."



Schultheis also put the D51 to work constructing a V-ditch and noted that the machine's quick hydraulic response is a plus in this application.

Schultheis spends the construction season working as an operator, but spends the off-season as an instructor at the 125-acre training facility that Local 649 (International Union of Operating Engineers) maintains near Mapleton, Ill. (just west of Peoria). So when we asked Local 649's training director, John Salzer, if we could bring a new Komatsu D51PX-22 to the site and borrow an instructor for a Hands-On-Earthmoving evaluation, Schultheis drew the straw.

In the slot-dozing exercise, Schultheis was impressed with the D51's ability to keep a large load rolling.

Komatsu's product manager for crawler dozers, Armando Najera, arranged to have the D51 shipped from Komatsu's Cartersville, Ga., demonstration facility. And on an unseasonably warm morning in late May, the *Construction Equipment* crew met up with Schultheis, Najera, and Komatsu product marketing manager, Bruce Boebel, for the evaluation.

D51 walk-around

First thing, Najera and Boebel gave us a tour of

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the new D51PX-22, which has a ready-to-work weight of 28,880 pounds and is the low-ground-pressure counterpart of the standard-track D51EX-22. These recently introduced 130-horsepower (net) machines, featuring a new Komatsu dual-path hydrostatic-drive system, are replacements for the D41P-6C and D41E-6C, which were rated at 110 net horsepower and used a Komatsu three-speed, planetary-type, powershift transmission.

"The D51 is designed to be very nimble and final-grading focused," said Najera, "but with the power and blade capacity to move dirt fast. You're not going to clear a shopping-mall site with this tractor, but you can still push a lot of dirt — and it might save bringing in a larger dozer on some sites."

The fresh engineering in the D51 makes it a considerably different tractor than either its D41 predecessor or its smaller hydrostatic-drive counterparts in the Komatsu line. For example, unlike the rigidly mounted undercarriages used on these machines, the D51 has oscillating track frames, employing an equalizer bar and pivot shafts, which are mounted forward of the final drives and absorb shock loads.

"Some users are of the opinion that oscillating track frames make grading more difficult," said Najera, "but Komatsu's extensive testing has shown little difference, compared to a rigid undercarriage."

Track assemblies for both D51 models (PX and EX) are identical, with seven rollers and 9 feet of track-on-ground. The only differences are track gauge (74 inches for the PX, versus 70 for the EX) and wider shoes (28 inches versus 20). Compared to its D41 predecessor, the new tractor is designed to provide 25 percent more undercarriage life, using thicker sprockets, larger-diameter bushings and longer links.

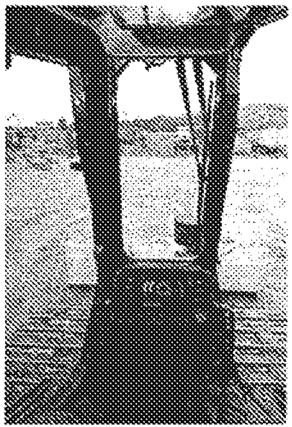
Since Schultheis had an hour or so on the previous day to get acquainted with the D51, he'd taken note of some of the new tractor's other design features. Among them were the shifted-forward operator's position and the uncommonly good view out the front window.

"This is the only tractor I've been on that lets you see the center of the blade," he said. "Usually, the hood is in the way. A new operator could learn faster on this machine, because of the visibility to the blade."

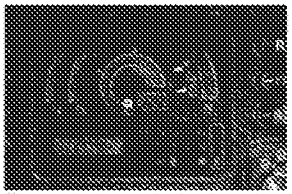
Najera explained that the operator's station is moved some 20 inches forward on the D51's new mainframe, in order to place it closer to the machine's center of gravity for improved balance. This position improves on the "back-of-the-bus" view afforded by some grading tractors, he said, and gives a more stable ride.

The good view that Schultheis mentioned results primarily from moving the D51's cooling package (radiator, oil cooler, charge-air cooler and fan) to the rear of the machine. With the engine compartment thus devoid of cooling components, the D51's nose can be dropped sharply to reveal more of the blade.

Operator Jim Shultheis runs machines during the work season, then shares his expertise with up-and-coming operators at Local 649's training facility.



When you're in theseat, the D51's hood virtually disappears. Note the footpads adjacent to the monitor; the D51, with its low center of gravity, performs well on slope work.



The tractor's newly de-signed monitor provides fault codes to assist with diagnostics, and the center display indicates ground speed, with the "1/2/3" markings equating to gears in a conventional powershift. The D51 is equipped with Komatsu's remote monitoring system, Komtrax, which the buyer can use free of charge for five years.

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And still on the subject of visibility, Schultheis called our attention to another D51 feature that impressed him.

"The exhaust stack is placed so that the right windshield post hides it. That's good thinking, because you already have a blind spot with the post, so why create another with the stack?"

As we moved around the machine, Schultheis rapped the D51's hood and said that when he checked the machine's fluids upon its arrival, he'd been impressed with the sturdy construction of the hood and service door.

"It's 6-millimeter [1/4-inch] material," said Boebel. "We didn't want the distraction of a vibrating, noisy hood when an operator's concentrating on the grade."

This brought us to the newly designed, 11-foot-wide, six-way (power angle and tilt) blade, which the D51EX also can use as an alternate to its 10-foot-wide version. The new blades for the D51 incorporate added box-section reinforcement for increased strength. The D51 also uses a newly designed, cast-steel, inside-mounted C-frame, which connects to the blade via a bolt-on center ball incorporating a large surface area.

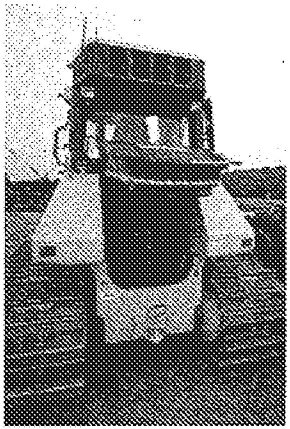
Last stop on the tour was the new cab, where Boebel gave Schultheis a run down on new features. In particular, Schultheis took note of the shape and texture of the joystick controllers — the left for steering and directional control, the right for blade control — saying that they fit his hands well, that they were neither too slick nor too sticky, and that the flare at the bottom of the levers was a natural support for the sides of his hands.

Boebel pointed out that in the left joystick are two buttons for "shifting" the transmission — actually for controlling the volume of oil flow through the hydrostatic system, and thus, regulating ground speed when the electronic throttle is turned up. This two-mode system, controlled by a selector switch on the dash, can program the buttons to increase or decrease ground speed in three distinct shifts, or in 20 seamless increments, the latter providing virtually infinite variation of speed up to the maximum.

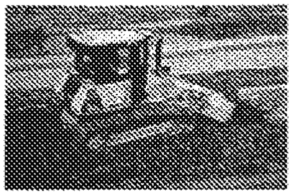
In the dirt

In the first exercise with the D51, Schultheis started at the bottom corner of a 200-foot-long, 30-foot high berm of well-compacted sandy clay, then pushed large loads up and across the face in a sweeping arc to the far bottom corner, cutting perhaps 5 inches deep. After a number of such passes, we asked for his thoughts.

"It's got power. It carried a lot of dirt for a finish machine — you can see the good-sized windrow it left. I don't think most grading tractors this size would move as much. I turned with big loads to see if the engine would pull down or the tracks would slip, but neither happened. This is sandy material, and if the tracks are going to slip, they'll do it here."



The cooling package canbe swung up even if a rear-mounted attachment is used. The fan is reversible for cleaning the heat exchangers, and even though the system is designed to pull most of its cooling air through perforated panels at the rear of the machine, it does draw some air from the engine compartment for added cooling. Isolation-mounted steel tubing conveys coolant between the engine and the aluminum radiator.



When grading in rough terrain, Schultheis noted that the glass in the doors allowed a distortion-free view of the work area.

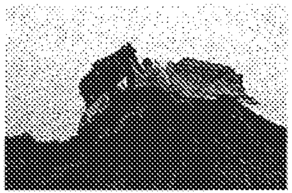
On a long push up and across a large berm, the Komatsu D51PX-22 handled big loads with no track-slip and no engine lug-down.

He also was impressed with the D51's control features:

"I liked the transmission buttons. I preferred the mode that lets you dial in speeds, because you can set the exact speed you want, which was just short of second gear on the indicator for this application. And you don't feel the shifts; it's very smooth. I also liked the detent in the forward/reverse lever. If you have to hold a lever in forward or reverse against spring tension, it's hard on your wrist. Overall, it's a very controllable machine — the steering is smooth, and the blade hydraulics are quick, but that's okay — you just adapt."

In a second exercise, we asked Schultheis to take the D51 into an area where student dozer operators had created a washboard — to get his opinion on how the tractor would handle itself in rough-terrain grading. In two passes, he could transform a swath of ridges and dips into an acceptable grade, but he said he'd make a third pass on a real job site. He commented again on the D51's power and controllability, and noted that the machine provided a good ride in this bumpy material. Then he made an observation that we'd probably never have considered.

In downhill dozing, Schultheis said the D51 exhibited a flat-footed stability.


We're not sure, but we thinkthe Komatsu guys went a little pale when Schultheis took their tractor up and over this 30-plus-degree pile of loose spoil.

In this story:

D51 walk-around

In the dirt

"The visibility from the cab is excellent, because whoever designed it realized that the flatter the doors, the better the view. The whole point of a grading tractor is seeing the work in front of you, but if the glass in the doors comes back from the windshield at too sharp an angle, you get a lot of distortion. You'll notice that a lot of finish hands will open the doors when getting close to grade — which defeats the whole idea of the cab to keep things quiet and clean."

We then asked if the set-forward operator's compartment affected his ability to judge the grade.

"I thought at first that it might. But like most operators on finishing tractors, I mostly feel what the machine is doing on the grade by what comes through the seat. This tractor still lets you sense that. A contractor once told me, 'Schultheis, your brains are in your [posterior region].' I said, 'thanks for the compliment.'"

Slot dozing was a third exercise, and the object here was to push as much dirt as possible. The D51's power was again at the top of the list for Schultheis, but he noted a couple of creature comforts as well.

"It impressed me with the amount of dirt it was rolling — and still no engine lug-down. It had the power to work at the speed I wanted. And the cab is very quiet — no need for earplugs. But that said, it lets you hear enough to know how the machine's performing. Good seat, too, plenty of adjustment, including the armrests. I'd say a lot of thought went into the design of this tractor."

Schultheis went on to do a bit of experimenting on his own with the D51, including building a V-ditch and taking it up and over a steep, steep spoil pile. We then asked him for his overall take on the new machine.

"I haven't been on a tractor this size that moved as much dirt. This machine is very friendly to run — someone's taken the time to design it from an operator's point of view."

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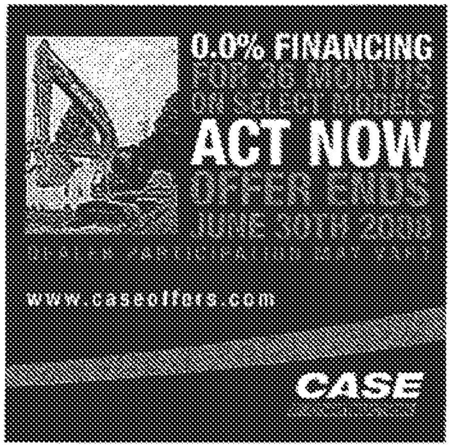

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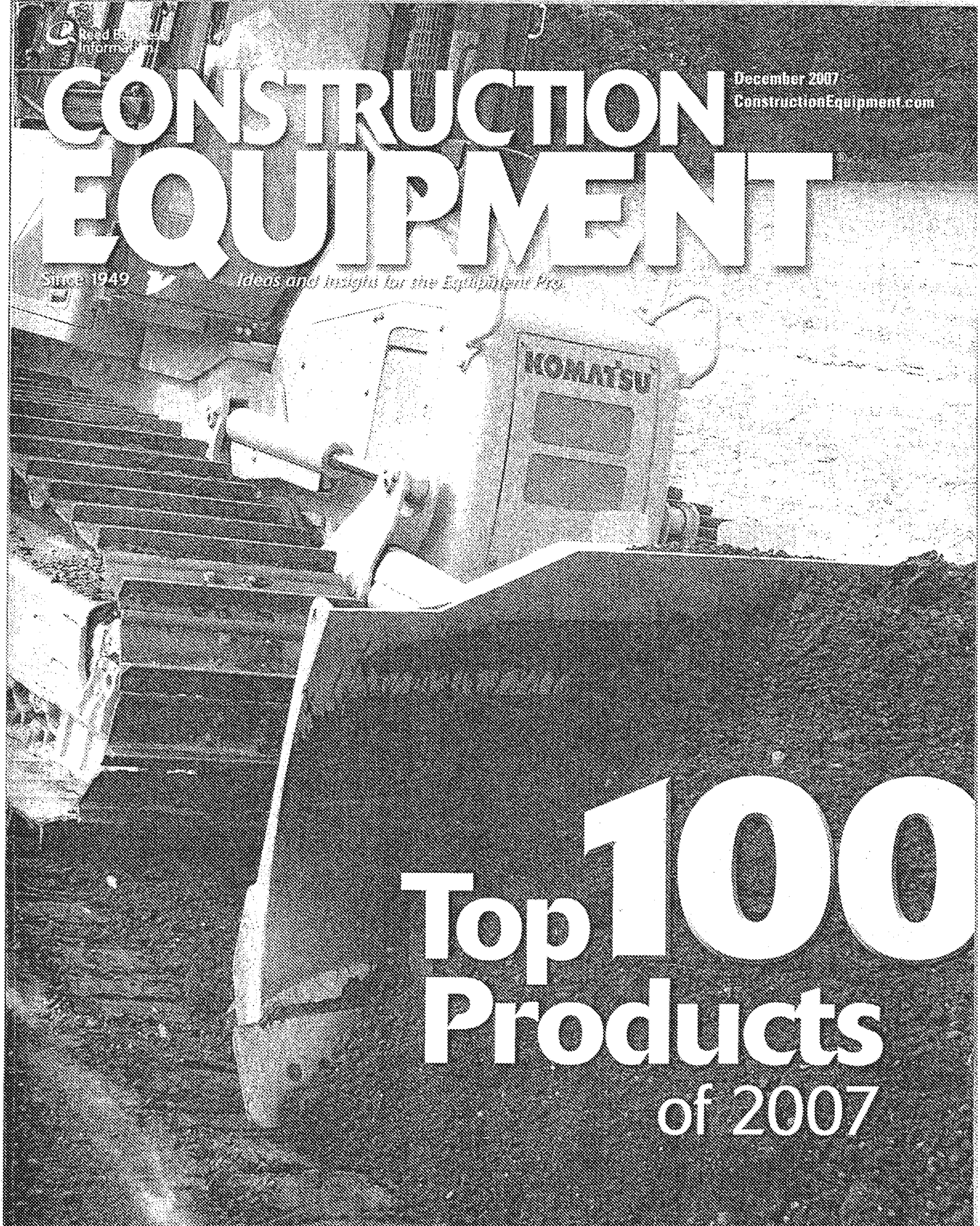
Evidence Appendix 3

EXHIBIT B



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Our Top 100 Products Award Program was conceived to call special attention to the most significant products introduced each year. We receive more than 1,200 product releases annually and publish nearly 600 of them. We have to choose each month which products have greater interest to the majority of our readers.

In evaluating products for the Top 100 Awards, we look for advances in technology, new product lines, significant improvements to existing products, or a product that increases competition in its field. Also, the highlighted products had to be featured in the magazine between November 2006 and October 2007. Because we narrow down the awards to 100 products, we may not be able to recognize other deserving products in the field.

◀ Komatsu D51 Dozer

Although Komatsu's D51 crawler dozer replaces the D41, the D51EX-22 (standard) and D51PX-22 (low ground pressure) boast a ground-up redesign. According to the company, there are no aspects of the machine that were not improved upon from the D41. The new machine uses a dual mode hydrostatic transmission (choice of 3 or 20 speeds) and a 130-horsepower Komatsu Tier 3-certified engine. By moving the cooling package from under the hood to the rear of the machine, the company was able to steeply slope the hood, providing best-in-class blade visibility. In addition, the operator's station has been moved forward almost two feet closer to the blade. It also features a new track design and 10- or 11-foot, six-way power angle tilt blade with a capacity of 3.5 to 3.8 cubic yards. Estimated list price: $150,000-$220,000.

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Evidence Appendix 4

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Press Contact
Gigi Thompson
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Hottest New Product Designs Announced

IDSA and *BusinessWeek* Name IDEA08 Winners

Visit www.idsa.org for detailed descriptions, photos, contact information on winners and more.

Dulles, VA (July 18, 2008)—The winners of the 2008 International Design Excellence Awards (IDEA) competition—a celebration of the most innovative and exciting product and product concept designs of the year and one of the world's most prestigious design competitions—exhibit a focus on sustainability, great attention to detail and, in a slowing economy, many offer surprisingly affordable price points. Designing existing products for a new market was also a trend in evidence when *BusinessWeek* and the Industrial Designers Society of America (IDSA) announced the winners today.

Out of 1517 entries, 35 were awarded the coveted Gold award, while 77 received Silver awards and 93 won Bronze awards. For the first time this year, 389 finalists were named in addition to the winners. For the first time in the history of the competition, the expert jury bestowed two "Best in Show" awards: one to SizeChina, a design research project that assembled data from a representative cross-section of people from mainland China to create the first-ever digital database of Chinese head and face shapes; and the other to Apple's now-iconic iPhone.

Showing a continuing upward trend in international participation, 109 designs from 25 countries outside the US were given an IDEA Award: Australia, Austria, Belgium, Brazil, Canada, People's Republic of China, Colombia, Croatia, Denmark, France, Germany, Hong Kong, Iran, Italy, Japan, Republic of Korea, The Netherlands, New Zealand, Singapore, Spain, Sweden, Switzerland, Taiwan, Turkey and the United Kingdom. 2008 also marked the inaugural year of IDEA/Brasil (www.ideabrasil.com.br), organized by Objeto Brasil and endorsed by IDSA, to spur interest in design from Brazilian corporations as well as to heighten global awareness of Brazil's rich design heritage. Out of 53 pre-judged Brazilian Finalists, 12 were honored with IDEA Awards, a remarkable success for the program's first year.

Outstanding design was the key factor behind the market success of winners such as the MC17 Mobile Computer, Roku Digital Music Transfer and the Milguard SmartTouch™ window lock. A new design vision enabled those products to meet the current challenges of the market and grow market share. The commitment to environmentally-responsible design shown by this year's student winners may indicate that the future of our planet is in good hands.

The *BusinessWeek* IDEA report hit the stands July 18 with an in-depth analysis of the winners. IDSA's quarterly magazine, *Innovation*, will publish information on the Gold, Bronze and Silver winners as well as the finalists in its *Yearbook of Design Excellence* this fall.

DECATHLON of France, EVA DENMARK A/S, Motorola, Apple and One Laptop Per Child were the top winners from the corporate world, with DECATHLON claiming six awards and the others each claiming four. The jurors were charmed by the Eva Solo waste bin (a bin that solves every common problem found in most current designs); impressed by the One Laptop Per Child XO Laptop, which juror Ryan Eder, IDSA cited as "brilliant design for an even better cause," and wowed by DECATHLON's innovative incorporation of a dual element structure and self-inflating mattress in a sleeping bag that will send people who never thought they'd camp out into the woods.

Among design firms, IDEO captured seven awards this year. fuseproject, Whipsaw and Ziba stood out with five, four and four awards, respectively. Art Center College of Design topped the list of college wins with a total of four awards.

The 2008 IDEA jury, comprised of 20 world-renowned designers and design thinkers, spent weeks previewing entries online and two-and-a-half days of intense, face-to-face evaluation and debate on IDEA. Judging criteria for each entry focused on eight areas of industrial design excellence: design innovation; benefit to the user; benefit to the client/business; benefit to society; ecological responsibility; appropriate aesthetics and appeal; usability testing; rigor and reliability (Design Research category); and internal factors and methods, implementation (Design Strategy category).

A "People's Choice" award will also be presented when the winners are honored in a formal ceremony at the Arizona Biltmore in Phoenix, Saturday, September 13, the final day of the anticipated 2008 IDSA National Conference & Education Symposium, followed by a gala celebration. Winners will be displayed in the Conference Design Gallery. All 205 winners with descriptions, photos and contacts will be featured on the IDSA Web site www.idsa.org, beginning July 18.

About IDEA, Industrial Designers & IDSA

The IDEA program fosters business and public understanding about the impact of industrial design excellence on the quality of life and the economy.

Industrial designers determine the form, use features and interaction qualities of manufactured products, packaging and digital media systems. They study people at work, at home and in motion to create satisfying experiences with products from the kitchen and the office to the hospital and the warehouse, shaping these to fit their customers and to make effective use of industrial processes. In this way, industrial designers have a quiet but profound presence in almost everything people encounter during the day.

IDSA is the voice of industrial design, committed to advancing the profession through education, information, community and advocacy.

Stay tuned to www.idsa.org/idea for information about the 2009 IDEA program. IDEA® is co-sponsored by *BusinessWeek* and IDSA.

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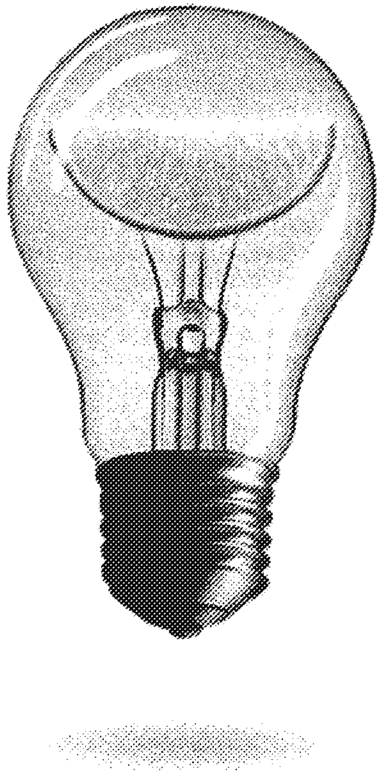

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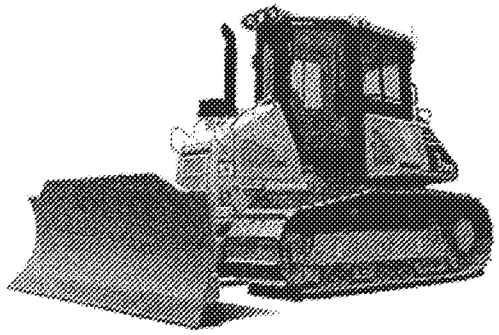
D51 EX/PX-22 Crawler Dozer



The D51 EX/PX-22's "super-slant nose" engine hood design represents the first time in the history of dozers that the entire top of the dozer blade is visible from the cabin at all times. This unique feature allows the operator to see objects that are very close to the blade, dramatically increasing safety and efficiency on the jobsite. This new design assures an improvement in fundamental dozer work parameters.

Contact: Hayato Kinoshita: hayato_kinoshita@komatsu.co.jp
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Evidence Appendix 5

PATENT

KL-US050678

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : ***Confirmation No. 7520***

Kazumasa Fukazawa et al. :

Serial No. 10/681,253 :

Filed: October 9, 2003 :

For: BULLDOZER WITH IMPROVED VISIBILITY (As Amended) :

DECLARATION OF MASAYUKI MUKAINO UNDER 37 CFR §1.132

I, Masayuki Mukaino, pursuant to 37 CFR §1.132, hereby declare:

1. I am a co-inventor of the invention disclosed in the above-identified application.

2. I am currently a general manager of Small Size Machine Development Group of Komatsu Ltd in Japan. I have been working as an engineer in the construction equipment manufacturing field for the past 27 years. Therefore, I believe I possess experience, skill and knowledge of what one of ordinary skill in the construction equipment manufacturing field would possess.

3. Attached hereto is Exhibit A that shows comparison of front visibility between the Komatsu D51-22 bulldozer having the claimed features and several conventional bulldozers A to D. In the conventional bulldozers, visibility of the front portion of the bulldozer from the cab is substantially blocked by a large engine hood. As shown in Figs. 1-3, 1-4, 2-3, 2-4, 3-3 and 3-4 of Exhibit A, in the conventional bulldozers, a center portion of the blade is completely hidden behind the engine hood, which covers a cooling module of the bulldozer, as viewed from inside of the cab. Therefore, an operator seating on the operator seat inside the cab could only see the transverse edges of the blade. To my knowledge, there has never been a bulldozer that allows the operator to see the top center portion of the blade.

4. The fact that the operator cannot see the top center portion of the blade can cause various problems in the conventional bulldozers. For example, the operator may not be able to see objects lying on the ground (e.g., finishing stakes, pickets, drainage ditches, manholes, etc.) when the bulldozer is used in a construction site or the like. Moreover, since the visibility of the blade is completely divided at the center portion of the blade by the engine hood and the operator can only see very limited areas of the transverse edges of the blade, it becomes even more difficult to ascertain the situation ahead when the angle of the blade is changed as shown in Figs. 1-4, 2-4 and 3-4. Although Figs. 1-4, 2-4 and 3-4 only show the case in which the blade is angled, the same problem (e.g., it is difficult to ascertain the situation ahead) occurs when the blade is tilted in the conventional bulldozers. When the bulldozer is used for leveling the ground, the operator needs to frequently perform tilting operation of the blade. Thus, when operating the conventional bulldozer, the operator must always estimate the information that is not visually available due to the existence of the large engine hood, such as location and orientation of the blade and condition of the ground in front of the blade, based on his or her experience. It usually takes a long time for an inexperienced operator to learn this skill.

5. Although the problems stemming from not being able to see the top center portion of the blade had been recognized in the conventional bulldozers, the solution to those problems was considered to be unavailable in view of the structural/design limitations of the bulldozer. In the conventional bulldozers, the cooling module including the radiator, the fan, etc. is coupled to the engine and disposed in the front portion of the cab. Therefore, in order to enable the operator to see the top center portion of the blade from the cab, the size of the radiator needs to be somehow reduced so that the height of the cooling module is shortened. However, the radiator in the cooling module must maintain a certain size that is usually defined by the heat dissipation needs of the engine. Therefore, improving the front visibility of the bulldozer by reducing the size of the cooling module was not feasible. Thus, it has been the general understandings and expectations of the bulldozer operators that not being able to see the top center portion of the blade is the way it is.

6. Our new design of the bulldozer provides the solution to the above-mentioned problems that have been recognized but not solved for a long time in the bulldozer manufacturing field. Our new design is revolutionary in that it enables the operator to see the top center portion of the blade, which has been perceived as an unavoidable blind area for a long time. As shown in Figs. 1-1 and 1-2 of Exhibit A, the overall blade visibility is dramatically improved in the bulldozer of our new design. Also, as shown in Fig. 1-2, since the operator can see the top center portion of the blade, the operator can easily ascertain the angle of the blade. Moreover, as shown on page 5 of Exhibit A, the bulldozer of our new design exhibits improved accessibility and visibility to the objects placed on the ground as compared to the conventional bulldozers.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Masayuki Mukaino

Dated: Feb. 20 '09

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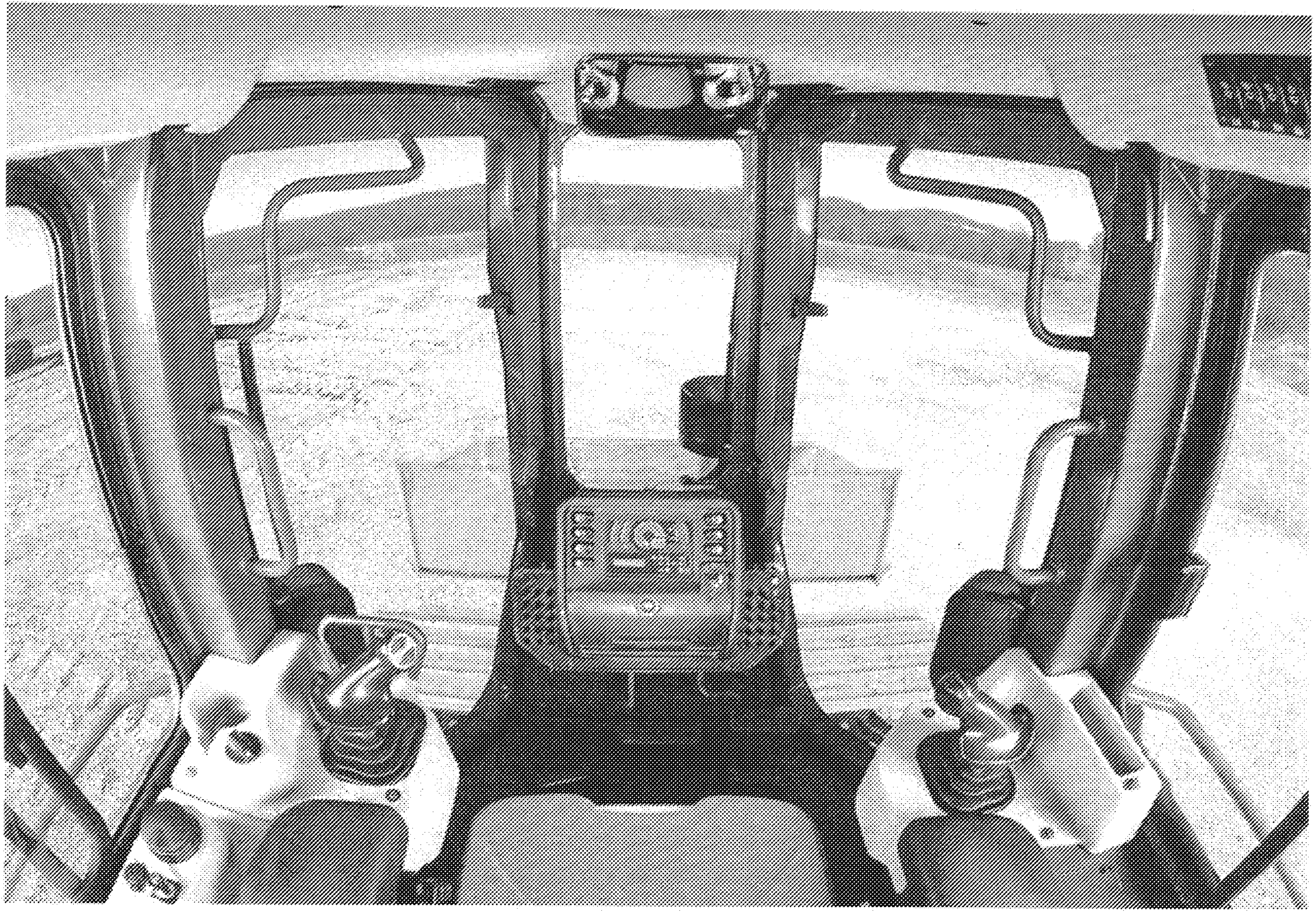
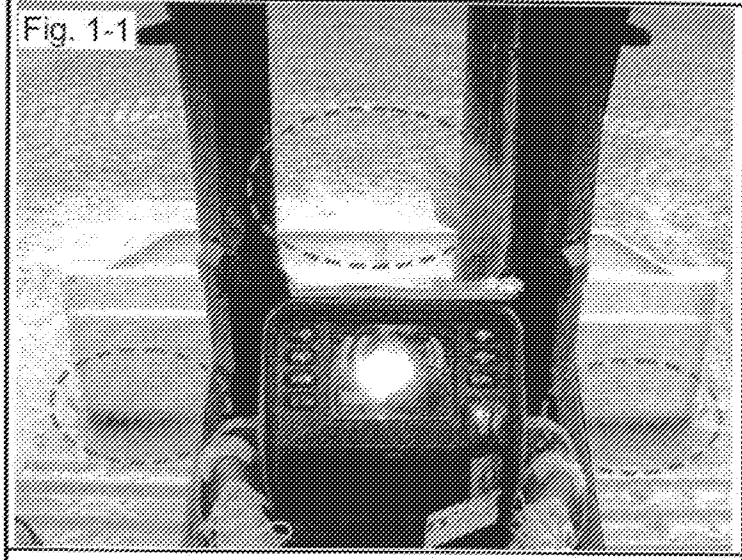
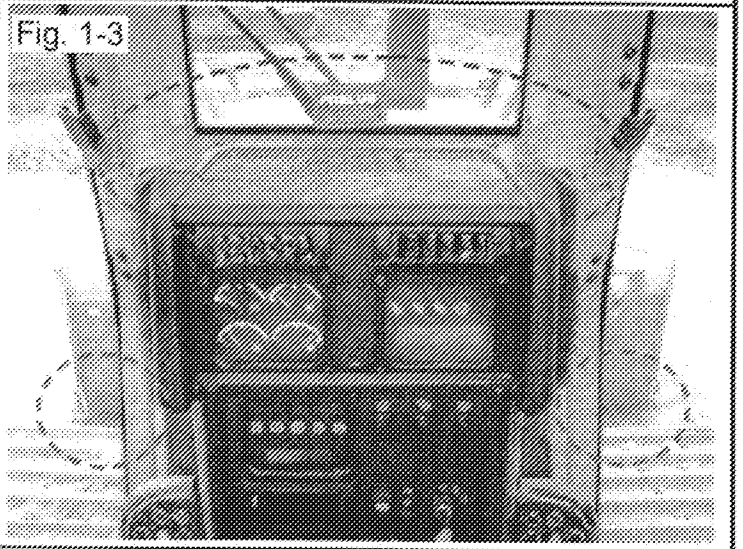
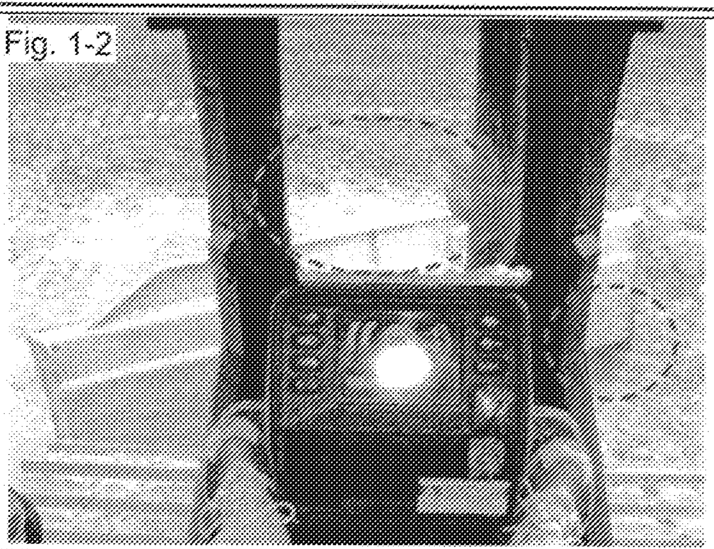
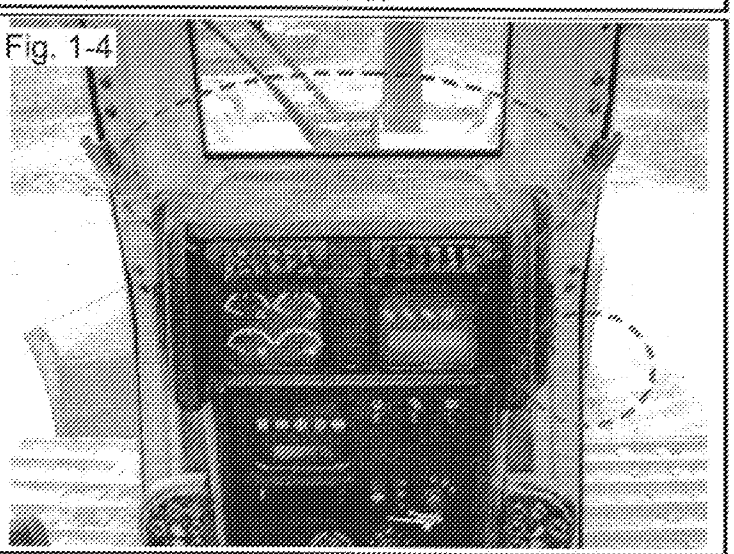
EXHIBIT A

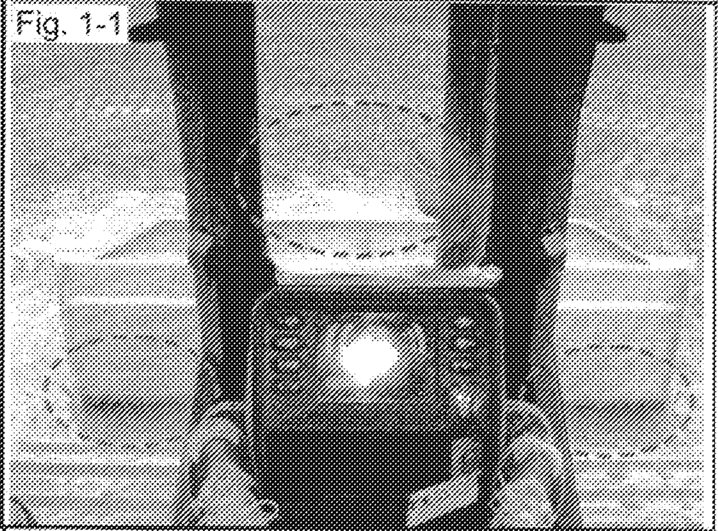
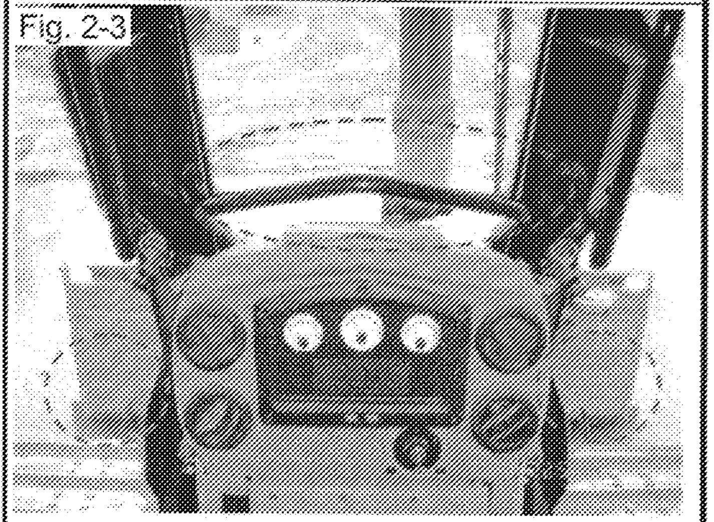
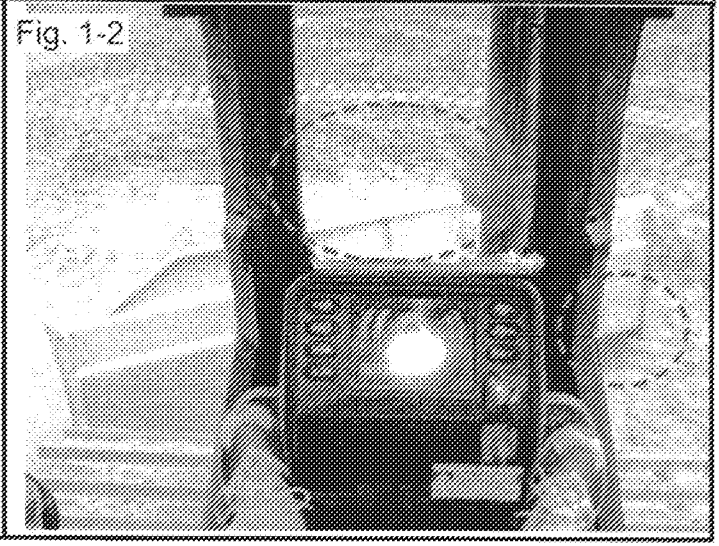
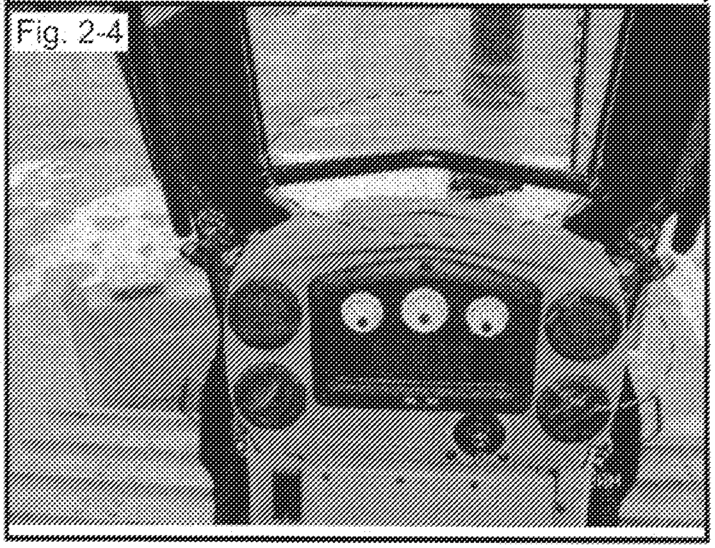
Komatsu D51-22



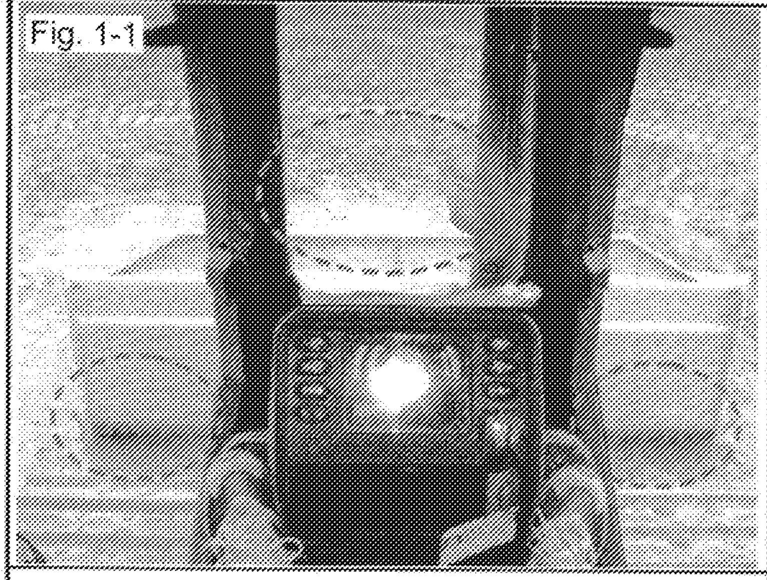
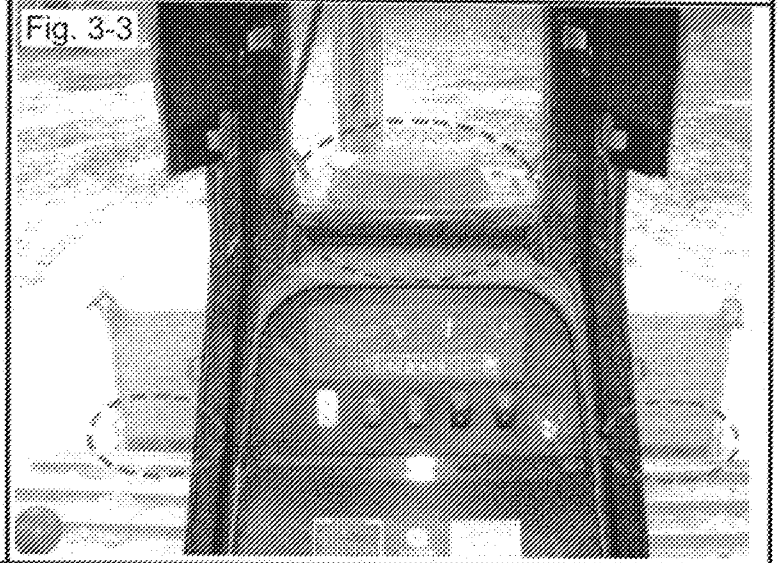
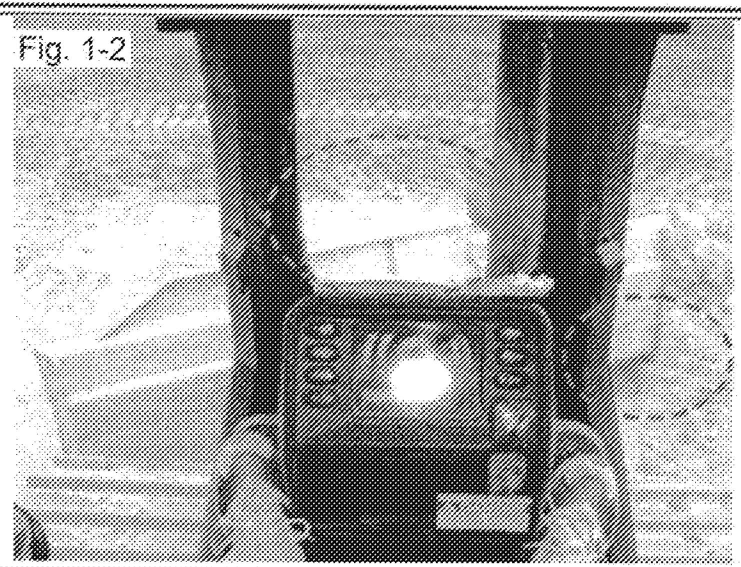
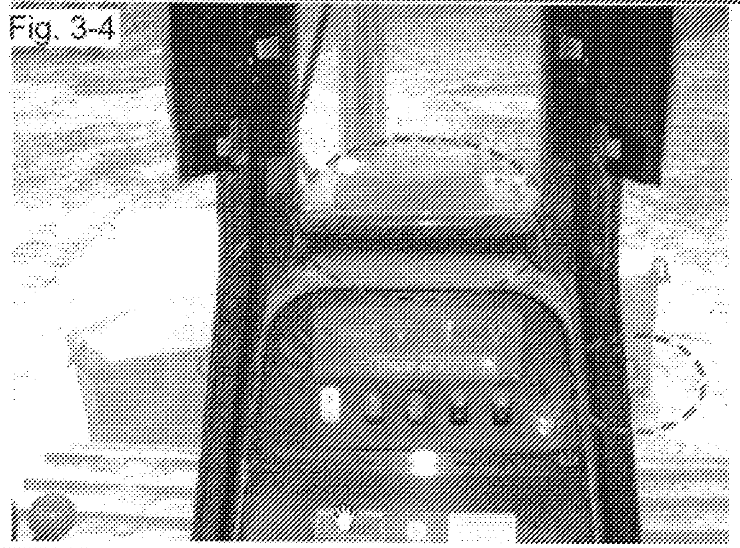
COMPARISON OF BLADE VISIBILITY (1)

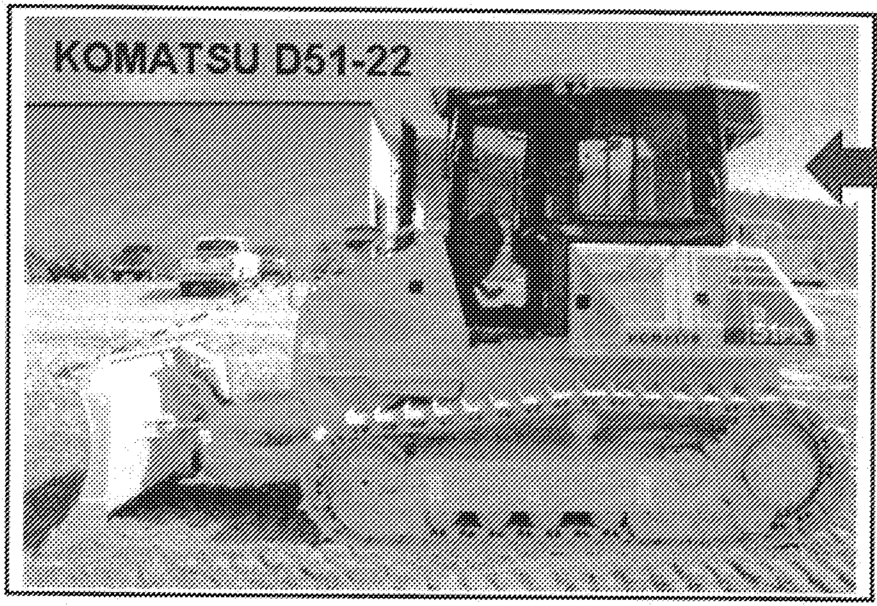
	Komatsu D51-22	Conventional Bulldozer A
Straight blade	 Fig. 1-1 44%	 Fig. 1-3 27%
Angled blade	 Fig. 1-2 32%	 Fig. 1-4 15%

COMPARISON OF BLADE VISIBILITY (2)

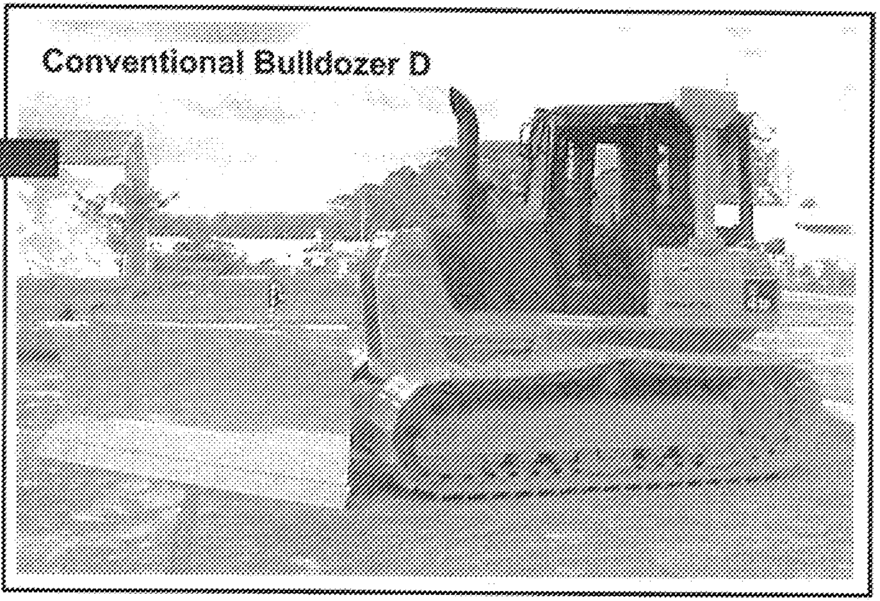
	Komatsu D51-22	Conventional Bulldozer B
Straight blade	 Fig. 1-1	 Fig. 2-3
Angled blade	 Fig. 1-2	 Fig. 2-4

COMPARISON OF BLADE VISIBILITY (3)

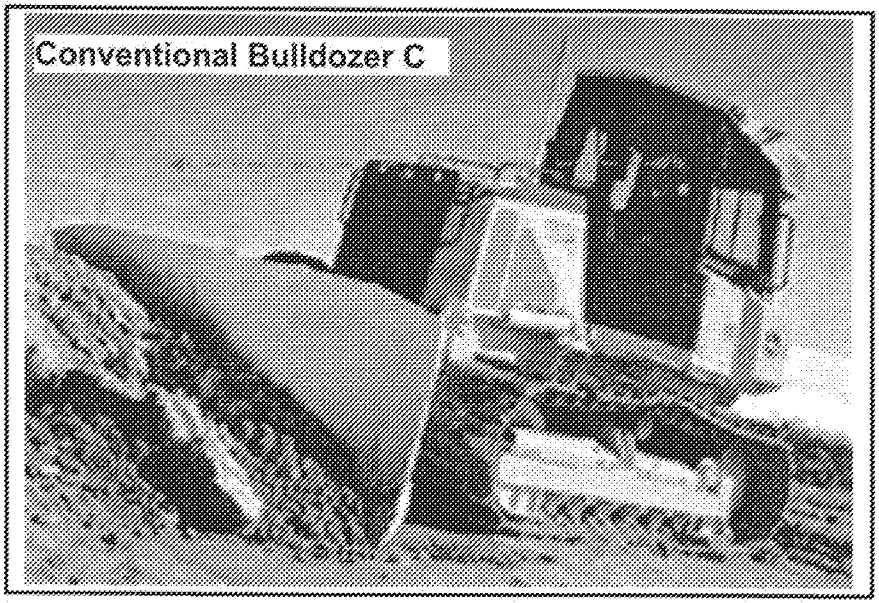
	Komatsu D51-22	Conventional Bulldozer C
Straight blade	Fig. 1-1 	Fig. 3-3 
	44%	35%
Angled blade	Fig. 1-2 	Fig. 3-4 
	32%	25%



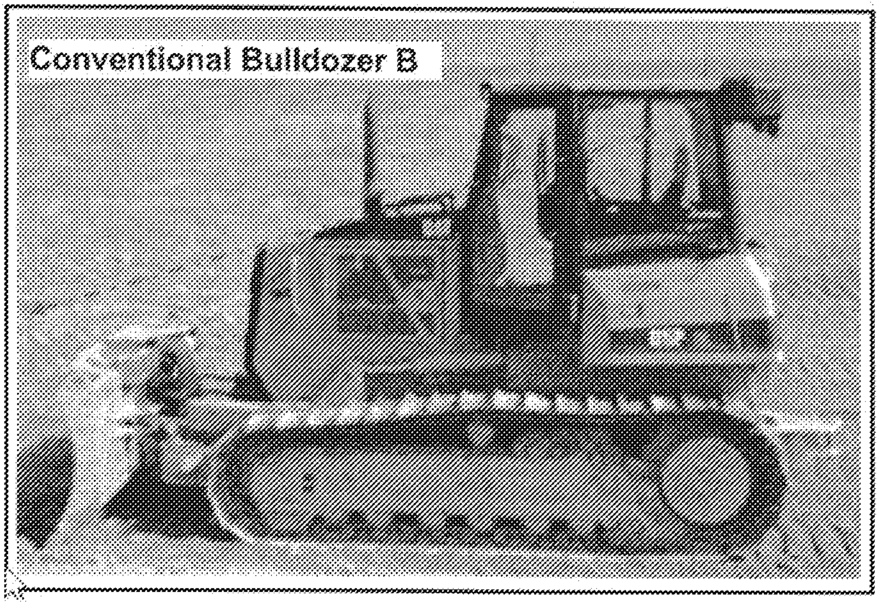
KOMATSU D51-22



Conventional Bulldozer D

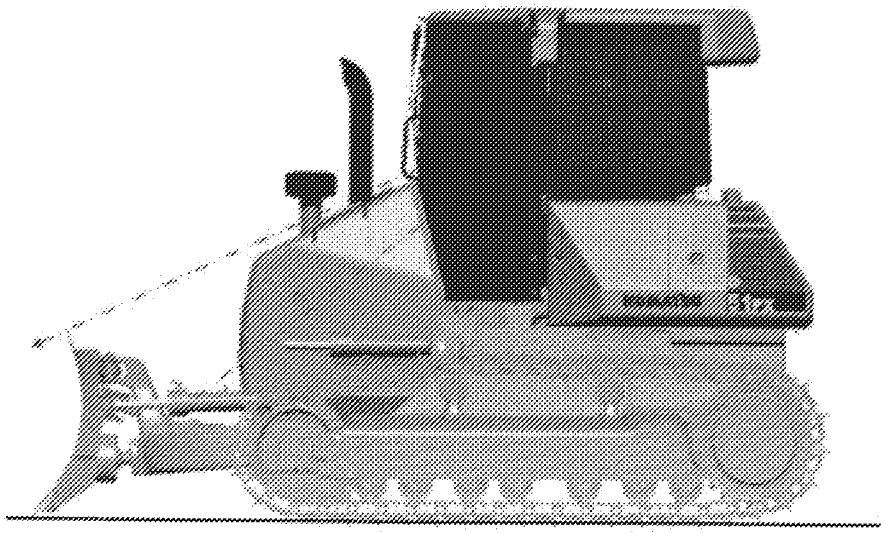


Conventional Bulldozer C

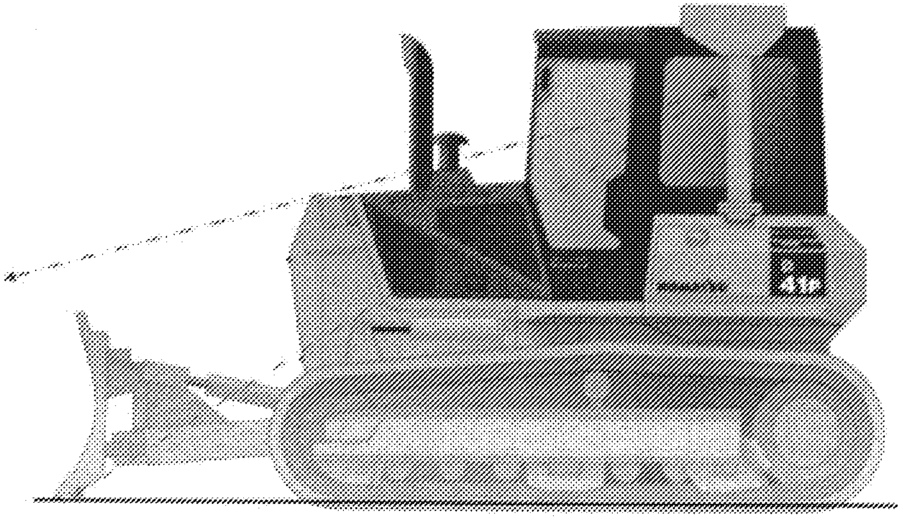


Conventional Bulldozer B

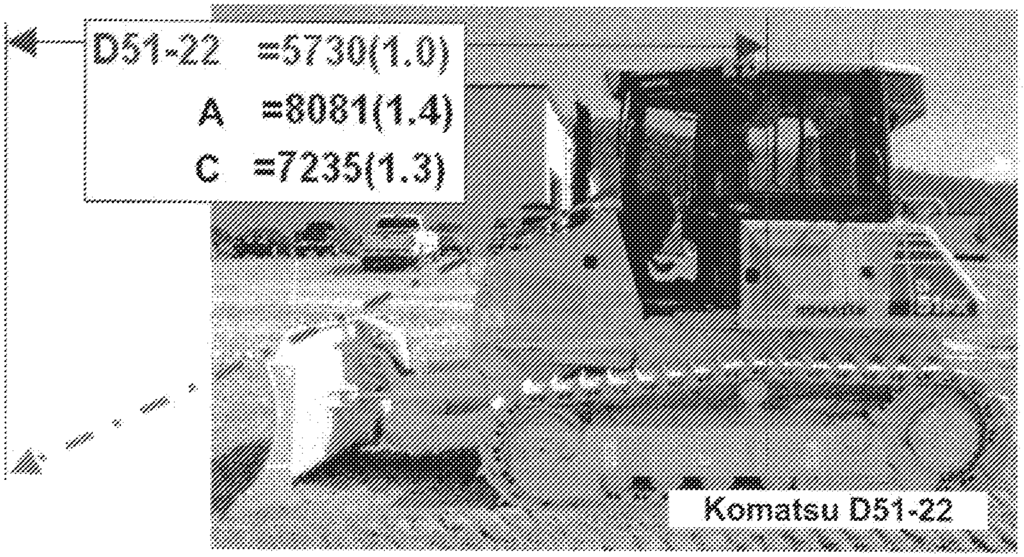
ACCESSIBILITY



Komatsu D51-22

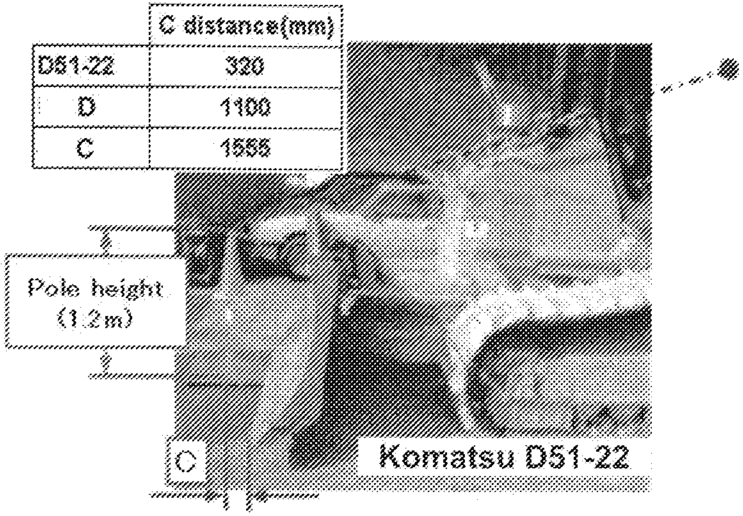


Conventional Bulldozer D



Komatsu D51-22

Accessibility



	C distance(mm)
D51-22	320
D	1100
C	1555

Komatsu D51-22

Evidence Appendix 6

High visiblity grunt

In what he describes as the smoothest and perhaps most comfortable dozer he's ever operated, Geoff Ashcroft tests Komatsu's new 13-tonne D51.

With the cooling pack out of the way at the rear, a sloping bonnet and a mid-mounted cab create

With the fresh take on engineering principles, Komatsu's D51 has raised the bar on dozer designs in the 13-tonne 'skim and trim' sector.

It sees the adoption of an almost mid-mounted cab and a steeply sloping nose that provides a level of visibility previously unattainable on any cabbed dozer design. From the seat, the firm claims that it's possible to see all four corners of the blade, and right across the top edge of the blade too.

In Komatsu's portfolio, the arrival of the D51 signals the firm's intentions to go head to head with Cat's D6K. It has allowed Komatsu to replace its D41 model using the D51 and the forthcoming D39, effectively giving Komatsu a much more complete range.

"We needed a machine that took performance, operator comfort, fuel efficiency and visibility up to another level," explains Peter Barrett, Marubeni-Komatsu's demonstrator. "And the D51 has achieved that goal and more."

Nor is there any carry-over of components from the D41; the new D51 dozer is a clean start, from the ground up. Getting that all-important view to the blade required a significant rethink for component packaging. Firstly, the cooling pack needed to be shifted from the front of the machine to the rear. With fewer components needed to be crammed into the engine bay, the bonnet could then be sharply sloped away.

But to take full advantage of the steeply sloping nose, the operator rearward visibility, so the cab was pushed forward by around 50cm, to suit.

"The cab is much further forward than traditional designs and, as such, is closer to the centre of the machine, placing the operator right on top of the machine's centre of gravity," he says. "It also means the ride comfort is much better, too."

An all-new cab structure, specific to the D51, supports that improvement in comfort. Mounted on cab suspension dampers taken from the firm's ADT range, the D51 soaks up vibrations and shocks through its four silicon-damped sprung cab mounts.

"The dozer uses many more thicker components and casings that offer much better stiffness and rigidity to cut down on unnecessary vibrations and noise levels," says Mr Barrett.

As with many other Komatsu dozers, the D51 comes in EX-22 and PX-22 versions, differing mainly in blade specifications, weight and shoe width, but under the skin, both are identical.

At the heart of the D51 is Komatsu's SAA6D107E engine that meets Stage IIIA emissions regulations. Shared with the PC200-8 excavator, it produces 130hp at 2200rpm in the D51 with the help of electronic common rail fuel injection, turbocharger and after-cooling. Getting access to the engine is simple enough, through an opening panel on the left-hand side.

"It is now possible to make all daily service checks from ground level, without having to climb on to the dozer," says Mr Barrett. "It's such a huge leap forward."

And without a cooling pack sat in the nose of the D51's engine bay, getting to belt-driven ancillaries for maintenance purposes simply requires the protective front plate to be unbolted and swung to one side on its hinges.

Elsewhere on the D51, there are service points for the two batteries, two windscreen washer bottles and fuses beneath the left-hand side window. And standing at ground level, it's also possible to make a visual check on coolant level too, using the expansion bottle that also sits in the service compartment. A similar compartment on the opposite side of the machine gives access to hydraulic system test points and filtration.

Those looking for the cooling pack need to walk round to the rear of the machine and look between the tracks, below the rear window. Protected by a heavy steel louvred frame that carries the hydrostatically controlled cooling fan, the cooling pack sees engine radiator, hydraulic cooler and air-to-air after-cooler stand shoulder to shoulder.

The swing-up, 800mm diameter fan assembly is raised on gas struts and locked open, to assist with cleaning when required. Though a fan reverse function is available, it is not automatically controlled and needs to be switched on/off from the cab.

However, it does offer a generous area for the dissipation of heat created by a 130hp engine and a hydraulic system that manages the blade and transmission functions. And cleverly integrated ducting, cast into the D51's chassis, allows air to be drawn through the underbelly of the dozer from the engine bay, through the radiators out at the rear of the machine.

Getting power from the engine to the track frames is the domain of a dual-path hydrostatic transmission system. The transmission comprises variable displacement pumps and motors that are able to deliver full power to both tracks, over a speed range that extends from 0-9kph in both directions. Compared to the D41's steering clutch and powershift-based transmission, the D51 is streets ahead.

Controls

Controlling the hydrostatic transmission is achieved single-handedly from the cab, using the left-hand joystick. It's possible to pulse the transmission to give infinite variation of speed, or access a quick-shift mode that selects one of three fixed 'speeds' at the touch of a button.

"This engine and transmission combination allows full power to be put through to the blade, even when making turns," explains Mr Barrett. "If you want to, there's enough power available to bury the machine simply by contra-rotating the tracks. It'll stand on the spot and go round and round in circles indefinitely."

Unlike the rigidly mounted undercarriage used on the D51's predecessor, Komatsu has opted for an

The cab of the D51 is mounted much further forward than traditional designs, helping to improve both visibility and ride comfort.

oscillating track frame design that uses an equaliser bar and pivot shafts, which are mounted forward of the final drives and allow the machine to absorb shock loads before they migrate up through the frame and into the cab.

"Ride comfort is greatly improved," he says. "And the undercarriage also benefits from a self-adjusting front idler support, which also helps to prevent pitching and nodding as track wear takes place."

That self-adjustment also contributes to reduced track noise and vibration too.

"Our design is one that eliminates track slap and that familiar clack-clack noise that you can get on some older machines," he says.

The track assemblies are identical on EX and PX versions, with seven lower rollers with track guide plates and two upper rollers helping to maintain track alignment and tension. EX and PX variants differ in terms of track pads – the EX gets a 560mm grouser, while the PX gets a wider, 710mm pad. And against the D41, the new dozer has been designed to provide 25 per cent more undercarriage life, using wider sprocket teeth, larger-diameter bushings and longer links.

Changes to the blade frame allow the D51's business end to be integrated high in the chassis. Doing so increases ground clearance and avoids the frame dragging, should the D51 find its way into soft, boggy ground conditions.

"It's much more than just a finishing machine – it's productive enough to be able to strip, push and stockpile materials with a level of productivity not seen in a machine of this class," adds Mr Barrett.

The new blades for the D51 incorporate additional box-section reinforcement for increased strength. For the D51 PX-22, that business end includes a 2.9 cubic metre capacity straight blade, measuring 3.35m in width. With power, angle and tilt (PAT) functions, the six-way blade can be angled sufficiently to reduce the D51's transport width to just 2.99m when fully angled to 28.5 degrees.

"We don't need special permission or folding blade sections to get within a 3m transport width," he says. "You can just load this one up and move to the next site without fuss."

The EX version can be fitted with the same 2.9 cubic metre blade, or a smaller capacity 2.7 cubic metre version.

The integration of Topcon machine control systems and Komatsu's satellite tracking and remote management system, Komtrax, make the D51 a formidable package that's plug-and-play ready for laser and GPS-based levelling systems. At the rear, the D51 PX-22 comes equipped with a drawbar, while the EX version can be fitted with a multi-shank ripper.

It's the D51PX-22 that EARTHMOVERS has the opportunity to evaluate, at Komatsu UK's demonstration centre in Birtley.

Big cab

First impressions are of a small machine that appears to be smothered with a big cab. As such, it looks somewhat unconventional, and for me not very attractive or inviting. But climbing up into the cab reveals that such proportions are essential to take advantage of the visionary experience. It really is a fantastic vantage point.

It's an easy climb too. With a footstep on the blade frame and plenty of handrails on the front corner and top edge of the bonnet to ensure a safe climb, making the move from ground level to cab seat is easy enough.

Settling into the air-suspended perch, I'm immediately hit by the view all around the machine, but particularly the amount of forward vision offered. From this cab, I can actually see everything that's going on at the blade.

This means no more guessing where the cutting edges might be, when not using such clever gadgets as laser and GPS machine control, which means there's hope for the inexperienced too. I can see all four corners of the blade with ease. Were it not for the Topcon installation fitted above the central dash, I could easily see the top of the blade too – not that it's important in this instance.

Also clever, the exhaust stack has been fitted with a kinked foot, so the silencer sweeps over to the right, blending in with the cab's A-post and freeing up yet more of a view over the front.

I look again, trying to find the bonnet, as it seems as though the engine must be almost on the floor, given the angle at which the hood slopes dramatically away from the cab.

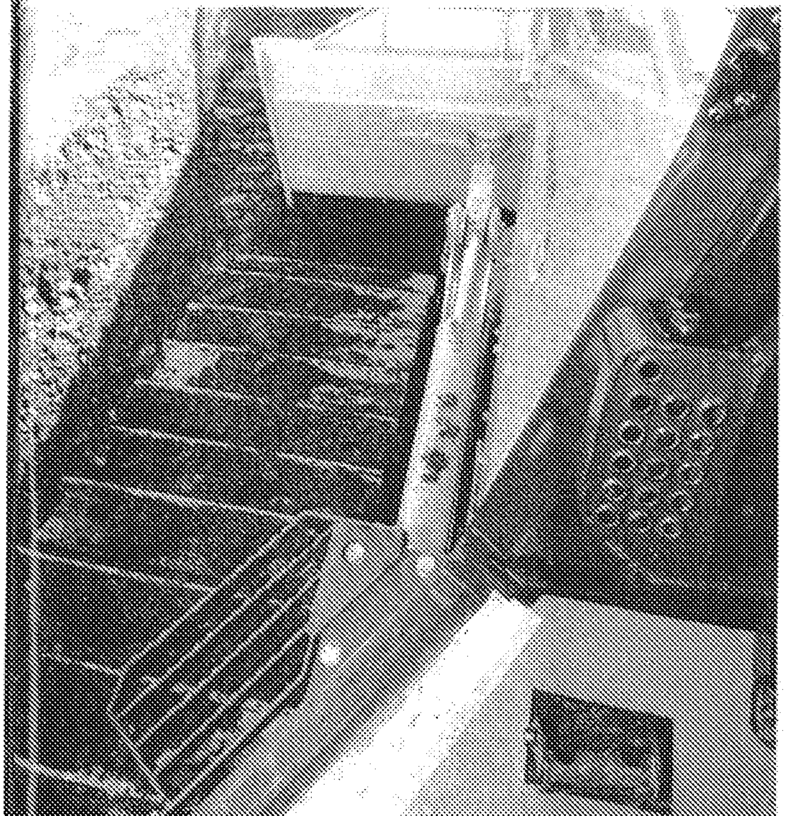
Even glancing over my shoulder, there's a reasonable view down over the back too – despite the seating position being almost directly above one of the top idlers.

I glance around the cab to familiarise myself with its layout, only to realise there's not too much to get to grips with.

Around the roof are controls for work lights, the radio, and a series of vents for the heating and air conditioning system. Temperature and fan controls are situated to the left-hand side of the seat, along with a rotary electronic throttle control – and if fresh air is your thing, the side windows can be slid open and latched, as required.

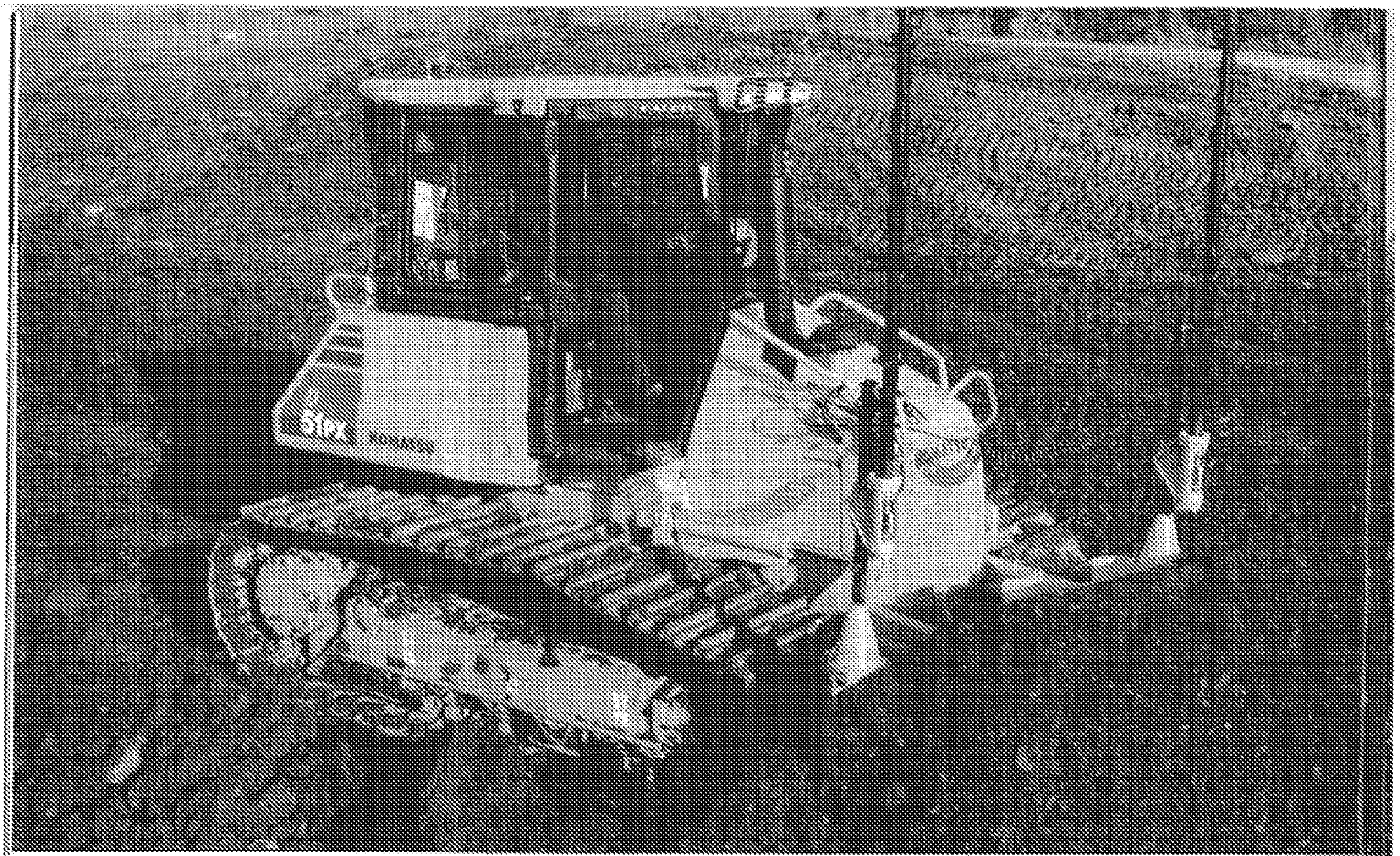
Either side of the slimline central instrument panel is a punched plate with footrests for those tricky, steep descents, while secondary footrests can be found on the floor when not using either the brake pedal or engine decelerator.

Understanding the central instrument panel



Below Left: Thanks to the steeply sloping bonnet, all four corners of the blade are easily seen from the operator's air-suspended seat.

Below: There isn't any carry-over of components from the previous D41 model. The new D51 dozer is a clean start from the ground up.



Above: For what is a basically a finishing dozer, Komatsu's D51 has terrific levels of pushing power, far more than you would expect.

is essential to exploit the D51's full capabilities. In addition to fuel level, water and hydraulic oil temperatures, the central circular display relates to transmission speeds, with each direction indicated by F and R. The numeric references from 1 to 3 relate to the transmission's quick-shift mode that selects one of three fixed 'speeds' at the touch of a button. Any shading above and below those numbers indicates infinite adjustment of speeds – selecting either mode is achieved using a switch to toggle between these two settings.

On the face of the left-hand joystick are two buttons, labelled 'up' and 'down'. These are used to control the flow of oil through the hydrostatic system, and give thumb-operated speed control for either quick-shift speeds or infinite adjustment of travel speeds.

If you want a higher or lower reverse speed, then you can dial that in too, by using the preset reverse speed button to tweak how the transmission responds. The electronics remember your last chosen setting, until the ignition is turned off – then factory default levels are restored.

I adjust the armrests and seat to put the joystick levers comfortably in my hands, and reach for the ignition key. The LCD-dash lights up like a Christmas tree and the six-pot engine rumbles gently into life.

Activating both joystick levers has the effect of releasing the parking brake, but being hydrostatic, the machine won't roll away. I raise the blade off the deck, hold the decelerator pedal down and dial up full revs, push the left-hand joystick forward and ease off the big pedal as the machine rumbles forward to the area I need to strip.

I've selected infinite adjustment of the transmission, so I dab at the button to raise my speed, easing back only as I prepare to lower the blade and make my first cut.

Despite the hydrostatic transmission, this dozer drives like it has a full mechanical connection between engine and tracks. There's a steady hardening of the exhaust note as revs drop slightly under load, then the D51 gathers all it's got and keeps pushing, and then pushes some more.

Rolling a full blade load is easy. And keeping that full blade while making turns across site is effortless too – and made all the more comfortable to achieve from being able to see the blade as if I'm sitting directly on top of it.

For a grading machine, it packs a lot of muscle, and I'm surprised about just how well it cuts and pushes. However, a keen hand on the transmission controller can also produce a bit of track slip on this soggy surface – but not until the engine has pulled down and grunted first, to let you know you're probably asking a bit too much.

Quick-shift

I try out the different functions of the hydrostatic gearbox, and selecting the quick-shift mode allows me to easily increase the reversing speed with ease. And with everything you tweak or adjust, the D51 communicates back to you through its responses, so you've a good idea of what's going on.

I'm soon running back across site at the D51's 9kph maximum speed. It's surprisingly quick and smooth. No track clatter, no jolts or jarring, there's no noticeable shift points on the transmission either. It's just a smooth, progressive ride. It has to be the smoothest and perhaps most comfortable ride I've ever experienced from a dozer.

Occasionally, however, I notice that the exhaust note becomes a bit intrusive, a bit too gruff for the quiet environment I'm sitting in during our evaluation. It leaves me with an impression that perhaps Komatsu can do a little bit more to take this rough edge off what appears to be a very well polished machine.

After reporting my findings, I'm told that the firm was already aware of the exhaust noise issue, and has since made a production-line modification to install rubber-damped components to further isolate the exhaust stack from the cab. Sufficient, says Komatsu, to lower the in-cab noise level by a further 2dB(A).

If there is any cooling fan noise from the rear, then I haven't noticed it in the cab with doors and windows shut, and air-con gently working.

Turning the D51 around is also effortless. While travelling in reverse, I pull the left-hand joystick towards me. The first stage of movement makes the dozer turn progressively, but pulling through a detent sends the tracks into contra-rotating mode, and the D51 pirouettes until I ease back on the lever.

Many pushes later, I've stripped an area that's ready to be rebuilt and trimmed to predetermined levels, and there are two ways I can go about it. The first is to rough the new layer out by eye – and I'm prepared to tackle the early stages the proper way, just to exploit the controllability of the D51, and to enjoy the flat glazed doors that don't appear to distort my view ahead.

But getting to final finished grade, or as close as our wet material will let us get, will be done using the installed Topcon system. That allows me to relax and enjoy the ride as the machine carries out its own blade raising and lowering at the touch of a button. Clever stuff.

After a while though, my right wrist tires of twisting the blade control lever to repeatedly angle the blade as I push excess material in a windrow, off to one side of the site. I'm convinced that Komatsu can make this easier to operate, just by adding a low-

Main Picture: When in automatic mode, the Topcon machine control system controls the blade and leaves the ground at the finished grade.

Right: The track assemblies include seven lower rollers with track guide plates. The EX version gets

KOMATSU D51 EX/PX SPECIFICATIONS

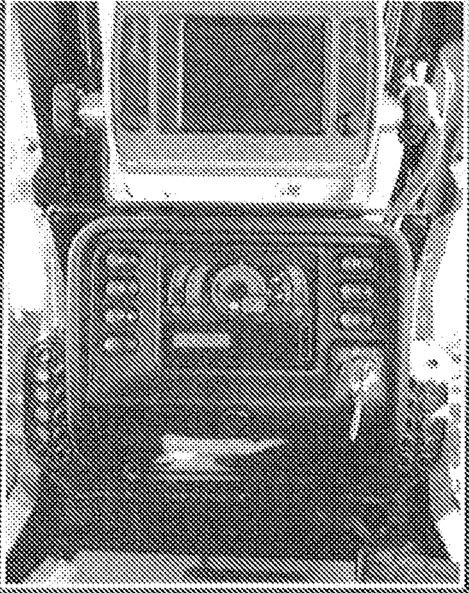
Machine weight:	12,710kg (EX), 13, 100kg (PX)
Blade:	2.7 or 2.9cu.m (EX), 2.9cu.m (PX)
Engine:	130hp, 6.6-litre Komatsu SAA6D107E-1 6-cylinder turbo
Transmission:	Hydrostatic, continuously variable
Working speed range:	0-9kph forward, 0-9kph reverse
Tracks:	560mm (EX), 710mm (PX)
Fuel tank:	270 litres

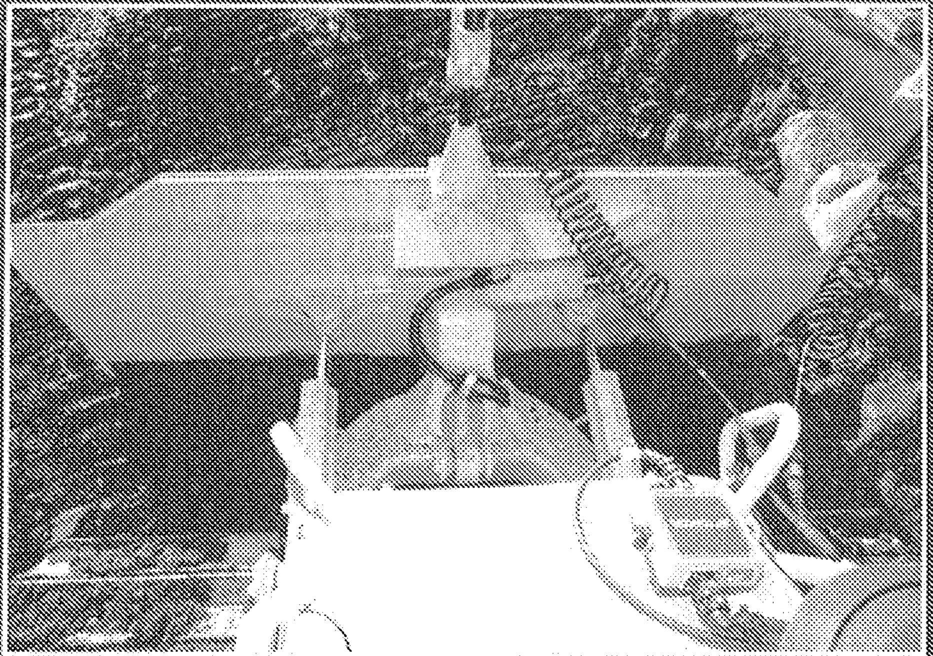
Main Picture: The Komatsu D51 fitted with a Topcon machine control system makes for very accurate finishing, with plenty of grunt in reserve.

Below: The power, angle and tilt (PAT) blade can be angled sufficiently to reduce the D51's transport width to just 2.99m.

Below Left: The Komatsu D51 offers a large, uncluttered and comfortable cab with great visibility; what more could you ask for in a dozer?

Left: Understanding the central instrument panel is essential to exploit the D51's full capabilities, particularly the various transmission controls.





effort thumb-wheel to replace the twist-action.

Despite this, the D51 remains an effortless dozer to operate. There's plenty of room in the cab, good choice of footrest positions and a relatively pleasant in-cab noise level, topped off with a view that's simply unmatched.

It's an extremely controllable machine, too. With a transmission that's as flexible as you could ever want – all the time capable of putting

Smooth, yet fast and powerful hydraulics make blade positioning responsive with the Topcon system, but sometimes a little too over-reactive when operated manually. But that's something you'd quickly adapt to.

And all this on a surefooted undercarriage that stops the dozer from nodding when you're trying to skim the surface in search of those last few millimetres. Could Komatsu have finally

Evidence Appendix 7

KOMATSU®

D51EX-22
D51PX-22

NET HORSEPOWER
97 kW **130 HP** @ 2200 rpm

OPERATING WEIGHT
D51EX-22: 12600 kg **27,778 lb**
D51PX-22: 13100 kg **28,881 lb**

D
51

CRAWLER DOZER

Photos may include optional equipment

D51-22 CRAWLER DOZER

WALK-AROUND

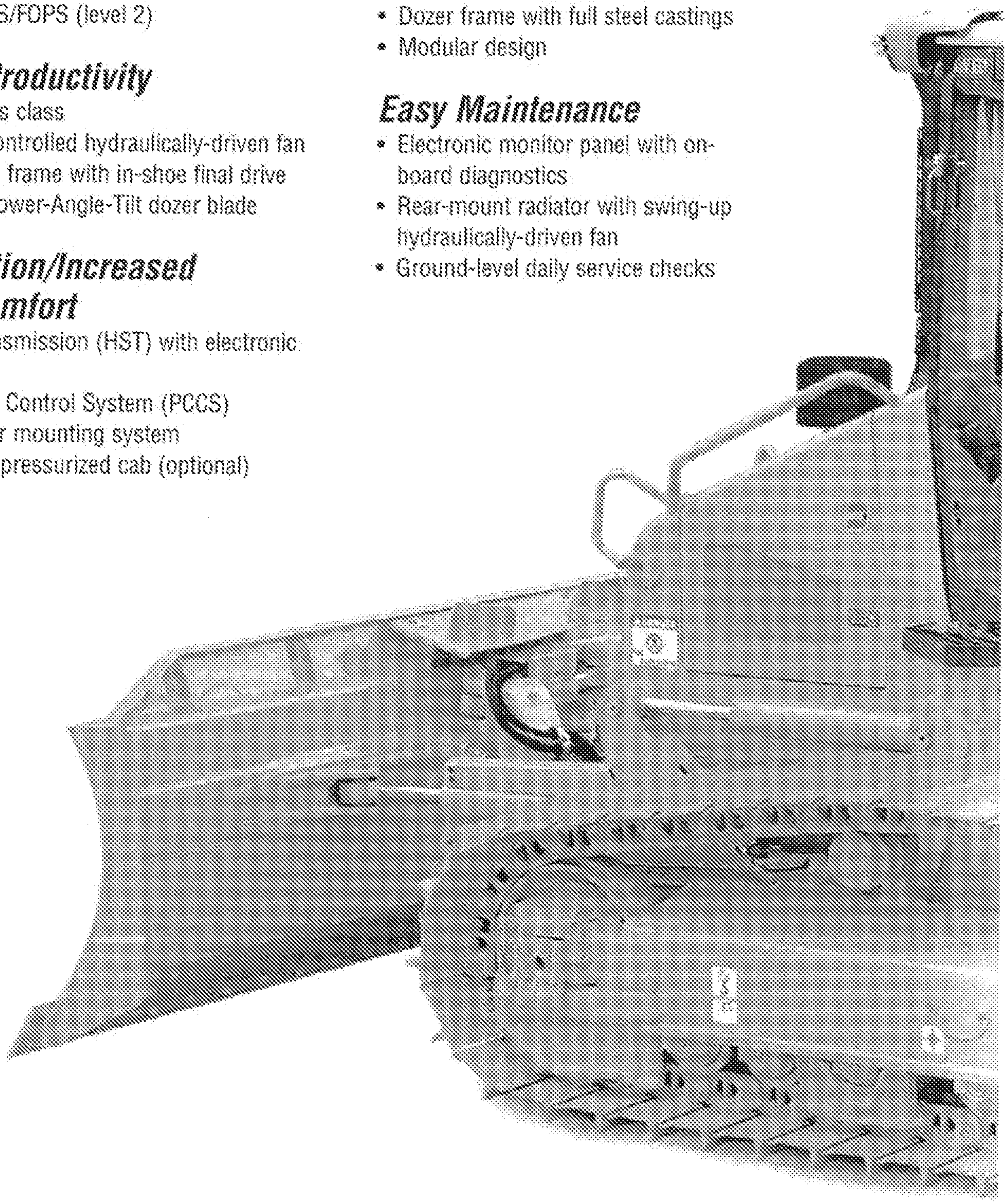
All-around Visibility
- Super-slant nose design
- Cab-forward design
- Integrated ROPS/FOPS (level 2)

Increased Productivity
- Highest HP in its class
- Electronically-controlled hydraulically-driven fan
- Oscillating track frame with in-shoe final drive
- High capacity Power-Angle-Tilt dozer blade

Easy Operation/Increased Operator Comfort
- Hydrostatic Transmission (HST) with electronic control
- Palm Command Control System (PCCS)
- New cab damper mounting system
- Large and quiet pressurized cab (optional)

Improved Durability
- New-design undercarriage
- Heavy-plate steel used throughout
- Dozer frame with full steel castings
- Modular design

Easy Maintenance
- Electronic monitor panel with on-board diagnostics
- Rear-mount radiator with swing-up hydraulically-driven fan
- Ground-level daily service checks



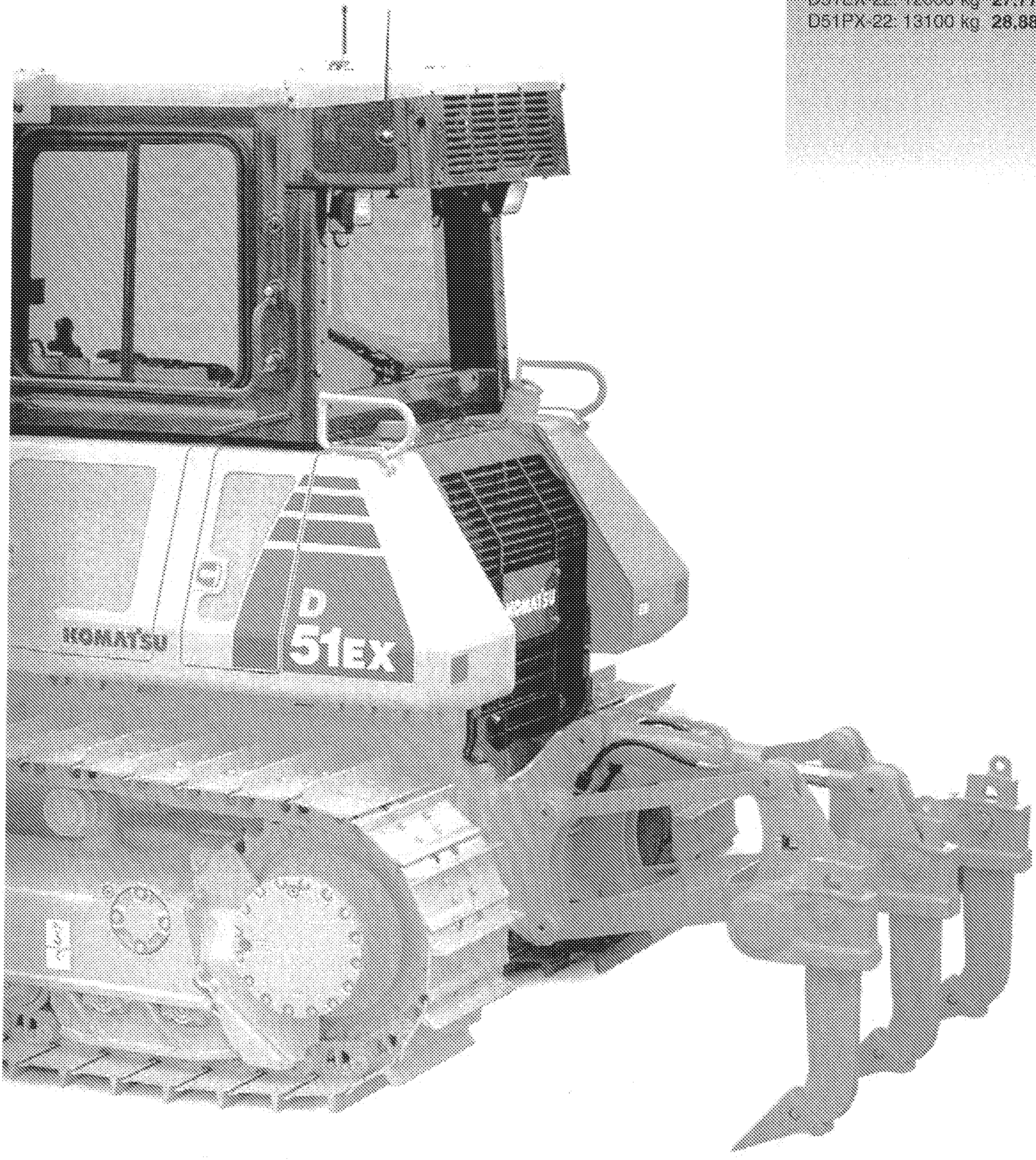
KOMTRAX

KOMTRAX equipped machines can send location, SMR and operation maps to a secure website utilizing wireless technology. Machines also relay error codes, cautions, maintenance items, fuel levels, and much more.

CRAWLER DOZER **D51-22**

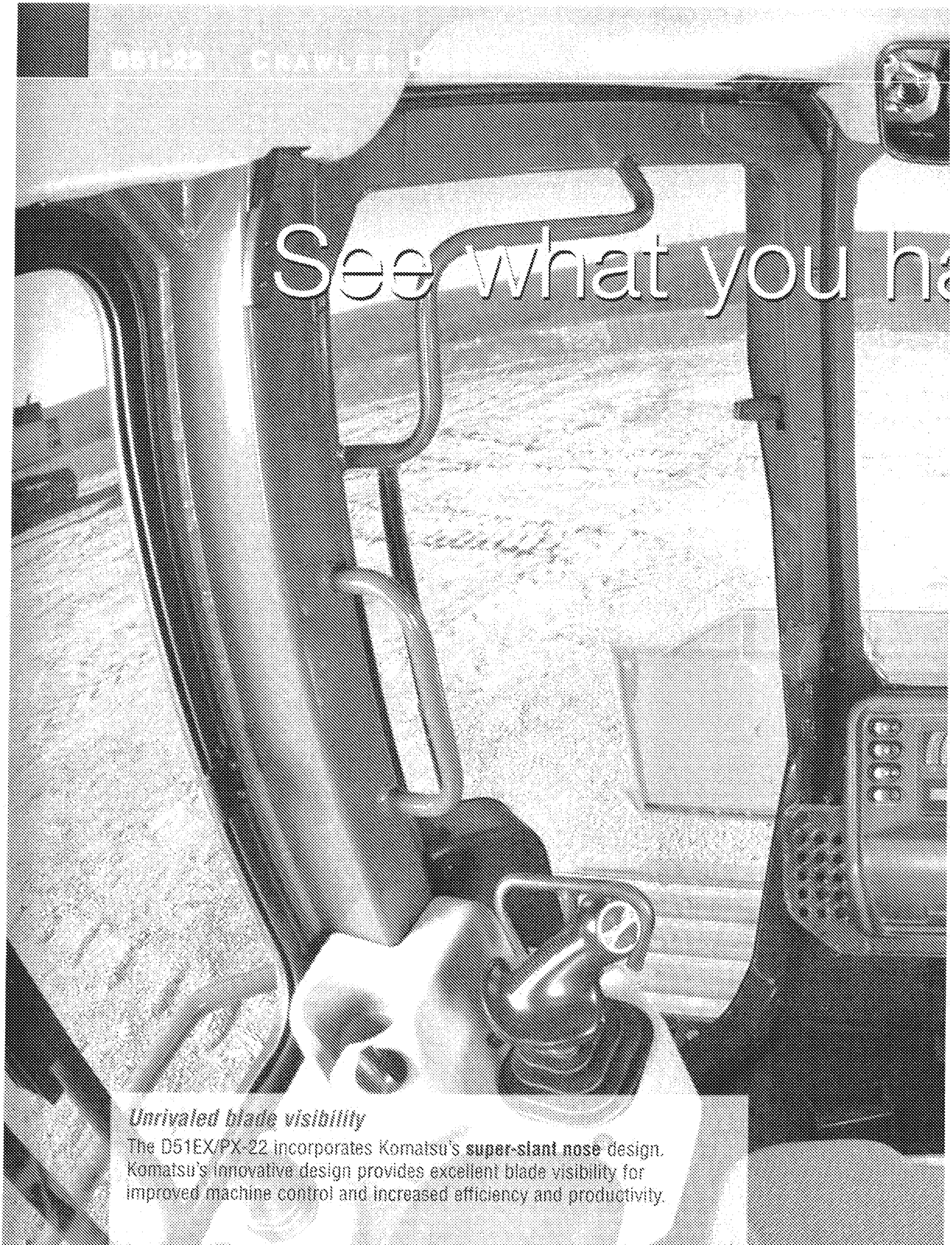
NET HORSEPOWER
97 kW **130 HP** @ 2200 rpm

OPERATING WEIGHT
D51EX-22: 12600 kg **27,778 lb**
D51PX-22: 13100 kg **28,881 lb**



Photos may include optional equipment

See what you ha

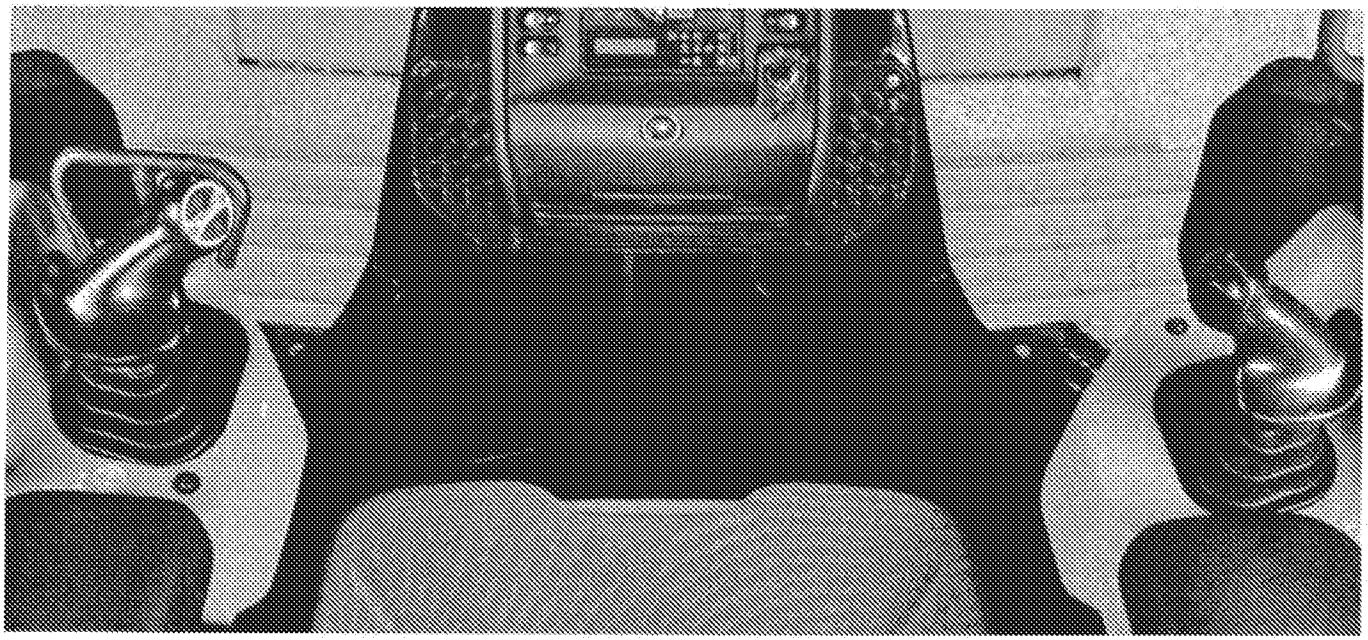


Unrivaled blade visibility

The D51EX/PX-22 incorporates Komatsu's **super-slant nose** design. Komatsu's innovative design provides excellent blade visibility for improved machine control and increased efficiency and productivity.

ve been missing!

OPERATOR COMFORT

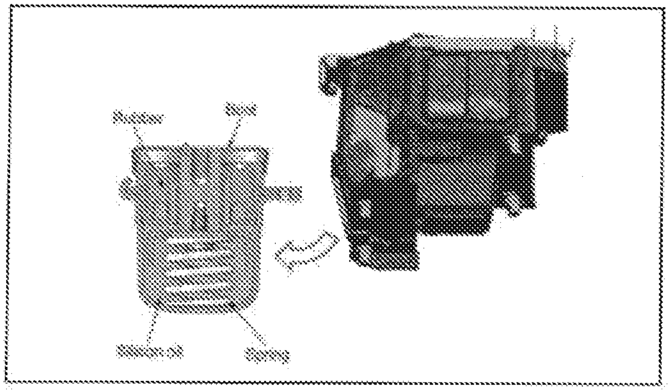


HST with electronic control

The D51 is equipped with Komatsu-designed Hydrostatic Transmission (HST) that allows for Quick-Shift or variable speed selection. The HST consists of dual-path closed-circuits with two variable displacement piston pumps and two variable displacement travel motors. Hydrostatic steering eliminates steering clutches and brakes, providing smooth powerful turns. Fully electronic control provides full automatic shifting and enables smooth control. Engine speed is controlled using an electronic fuel control dial.

Comfortable ride with cab damper mounting

The D51's cab mount uses a cab damper system that provides excellent shock and vibration absorption which conventional mounting systems are unable to match. The silicon oil filled cab damper mount helps to isolate the cab from the machine body, suppressing vibration and providing a quiet, comfortable operating environment.



Palm command Proportional Pressure Control (PPC)

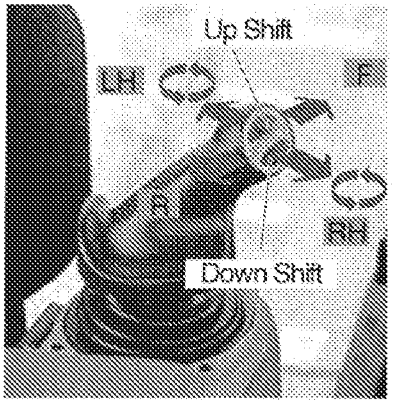
PPC-controlled palm command joystick provides blade control. Combined with the highly reliable Komatsu hydraulic system, precise control is the result.

Closed-center Load Sensing System (CLSS) hydraulic system

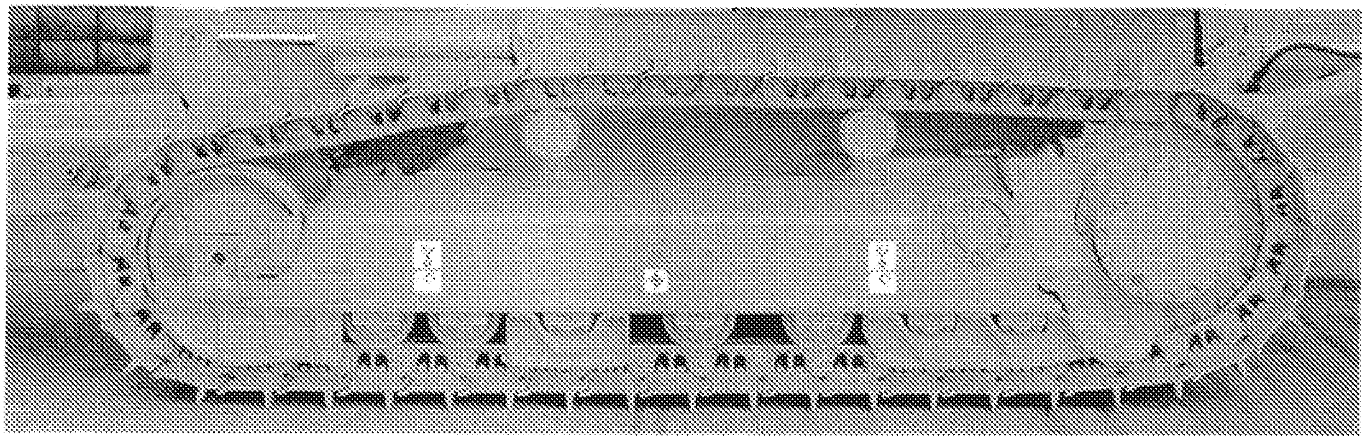
With CLSS hydraulics, blade lever stroke is directly proportional to blade speed, regardless of the load and travel speed. This results in superb fine controllability.

Palm Command Control System (PCCS)

The low-effort PCCS joystick controls all directional movements including machine travel speed as well as counter-rotation.



DURABILITY FEATURES



Heavy-duty undercarriage

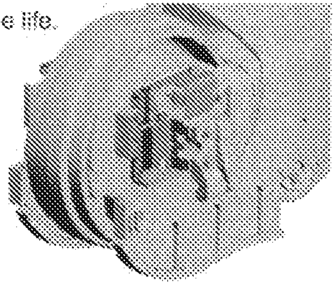
Large link, large bushing diameter, and wider sprocket teeth extend undercarriage life. The two-carrier roller design maintains track tension and alignment.

Monocoque track frame

Komatsu's monocoque track frame design using thicker box section material and fewer welded components provides increased rigidity and strength.

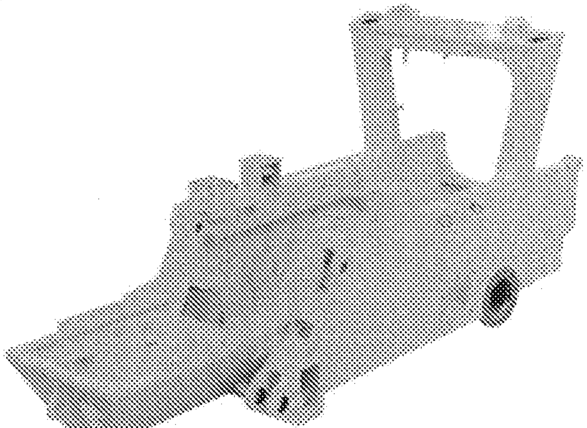
Self-adjusting idler support

The self-adjusting idler support provides constant and even tension on idler guide plates reducing noise and vibration and increasing undercarriage life.



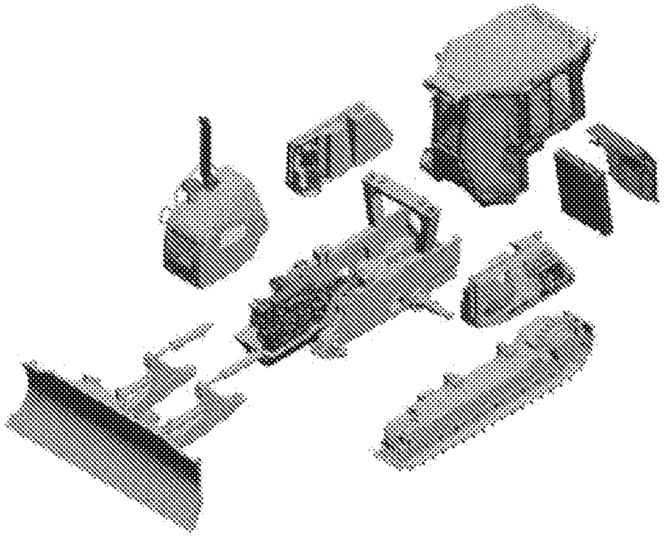
Mainframe

High-rigidity simple hull frame structure combined with thick plates and steel castings provide increased reliability and d



Modular design

One of the design goals behind the creation of the D51 was to manufacture a more durable machine. This was achieved by reducing component complexity and using a strong modular design for increased serviceability and durability.



One-piece nose guard

Simplified high-rigidity structure with thicker plates reduces vibration and noise.

Dozer frame

Steel castings reduce the number of welds, improving C-frame rigidity and strength.

PRODUCTIVITY FEATURES

This engine is EPA Tier 3, EU Stage 3A and Japan emissions certified; "ecot3" - ecology and economy combine with Komatsu technology to create a high performance engine without sacrificing power or productivity.

Fuel efficient electronic controlled engine

The Komatsu SAA6D107E-1 engine delivers a net output of 97 kW **130 HP** at 2200 rpm. The powerful Komatsu engine incorporated into the D51-22 makes this dozer fuel efficient and the logical choice in both grading and dozing operations. The engine is turbocharged and features direct fuel injection and air-to-air aftercooling to maximize power, fuel efficiency, and emission compliance. To minimize noise and vibration, the engine is iso-mounted to the main frame.

Hydraulically-driven cooling fan

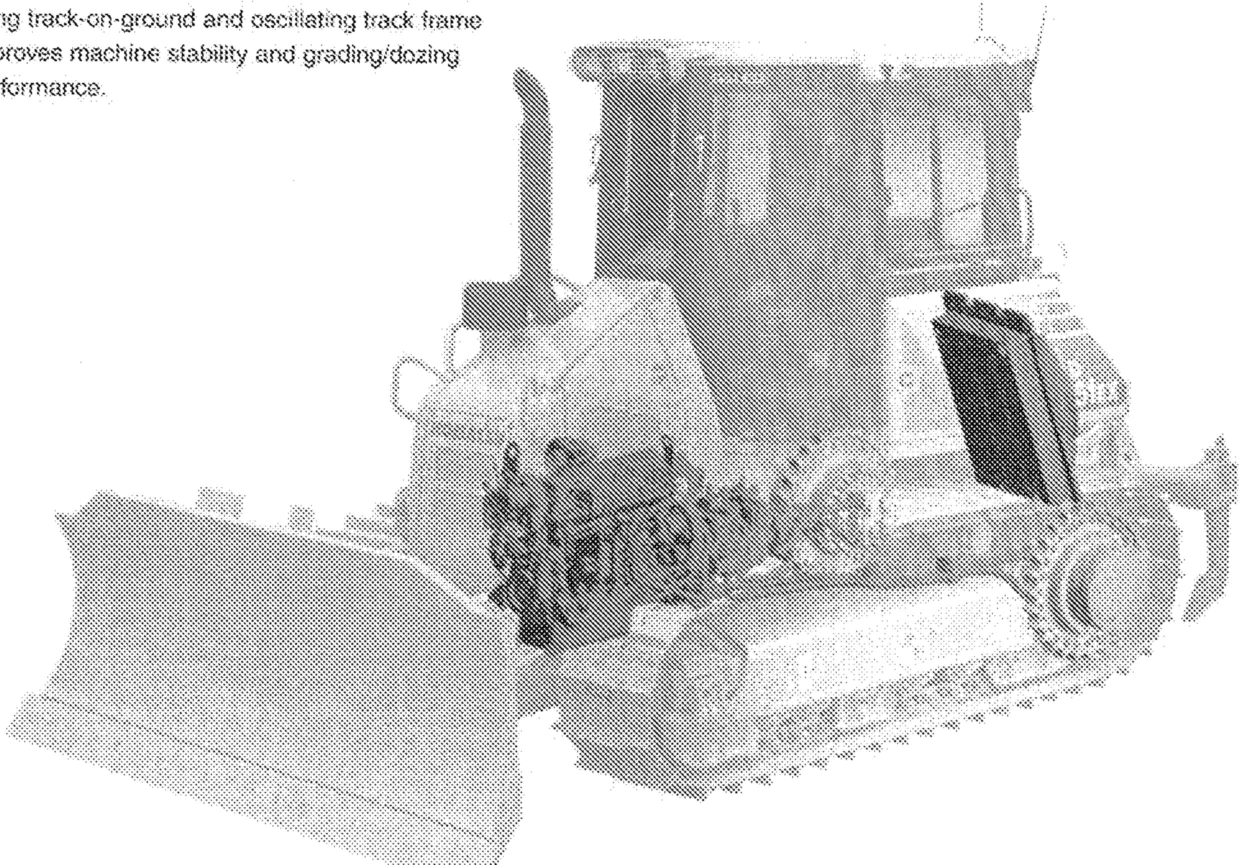
The engine cooling fan rotation speed and direction is electronically controlled. The fan rotation speed depends on engine coolant and hydraulic oil temperatures; the higher the temperature, the higher the fan speed. This system increases fuel efficiency, reduces operating noise levels, and requires less horsepower than a belt-driven fan.

Long track-on-ground and oscillating track frame

Long track-on-ground and oscillating track frame improves machine stability and grading/dozing performance.

Hydrostatic Transmission (HST) control system

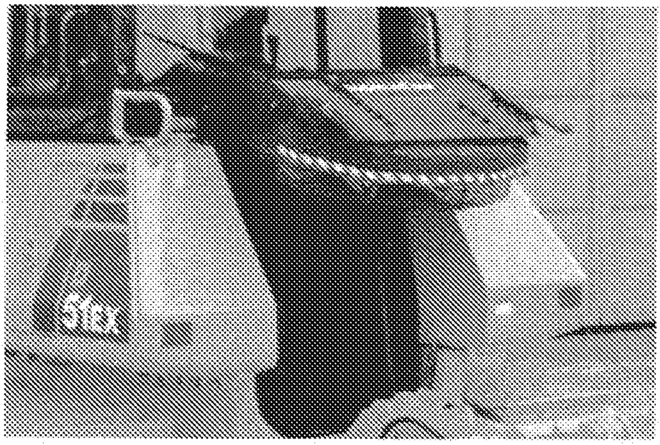
The HST controller monitors engine output and work equipment/travel load. It controls HST pump and motor displacement to provide the optimum speed and drawbar pull. Power to both tracks during turns and counter-rotation makes the D51 extremely maneuverable.



MAINTENANCE FEATURES

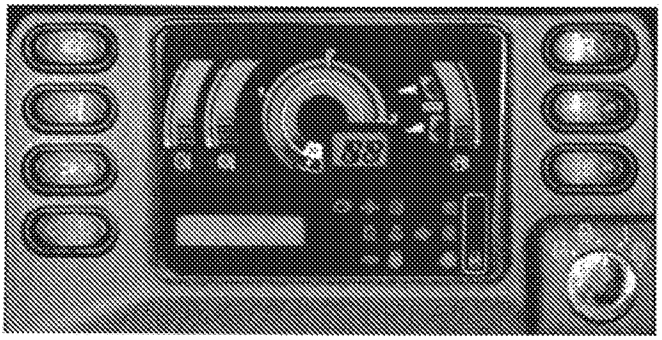
Hydraulically-driven swing-up fan

The D51-22 utilizes a swing-up fan with a gas strut-assisted lift locking system to provide easy access to the radiator, oil cooler, and charge air cooler. The swing-up feature makes it easier to access cooling cores. The hydraulic fan has a "cleaning" mode. The fan rotates in the reverse direction and helps to clear off objects in front of the cooling areas.



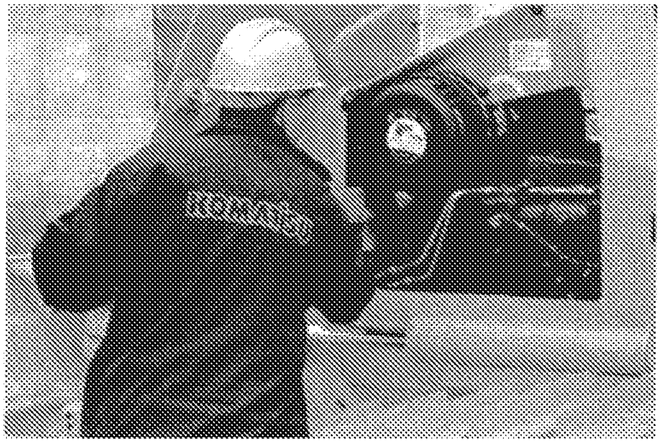
New monitor with self-diagnostic function

The monitor system provides critical information about the machine. It provides operating condition status and notifies the operator with a lamp and buzzer when an abnormality occurs. In addition, fault codes are indicated to aid troubleshooting and help reduce machine downtime. Service reminders for fluids and filters are also indicated.



Daily checks

All daily checks can be performed efficiently at ground level.



Remote grease points

Remote grease points facilitate lubrication of the C-frame pivots, equalizer center pins, and angle cylinder bearing.

Segmented sprocket teeth

This design reduces servicing time as compared to solid sprocket designs. Each of the nine bolt-on segments can be replaced without splitting the track.

Adjustment-free parking disc brake

An adjustment-free spring-applied hydraulic release wet parking brake is located in each final drive.

D51-22 CRAWLER DOZER

SPECIFICATIONS

ENGINE

Model	Komatsu SAA6D107E-1*
Type	4-cycle, water-cooled, direct injection
Aspiration	Turbocharged, air-to-air aftercooled
Number of cylinders	6
Bore x stroke	107 mm x 124 mm **4.21" x 4.88"**
Piston displacement	6.69 ltr **408 in³**
Governor	All-speed, electronic
Horsepower	
SAE J1995	Gross 99 kW **133 HP**
ISO 9249 / SAE J1349	Net 97 kW **130 HP**
Hydraulic fan at maximum speed	Net 90 kW **120 HP**
Rated rpm	2200 rpm
Fan drive type	Hydraulic (reversible)
Lubrication system	
Method	Gear pump, force lubrication
Filter	Full-flow

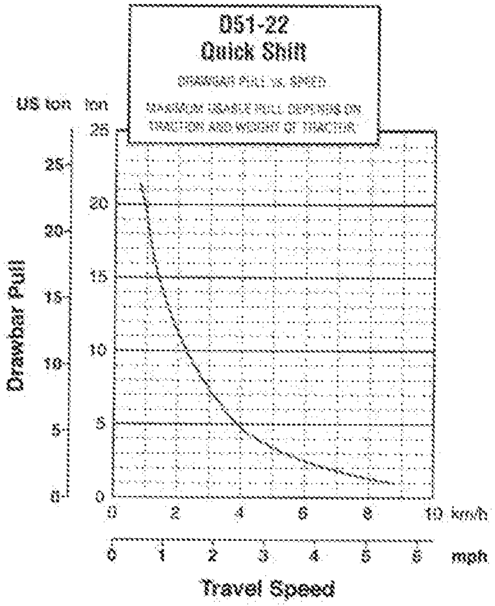
*EPA Tier 3 emissions certified

HYDROSTATIC TRANSMISSION

Dual-path, hydrostatic transmission provides infinite speed changes up to 9.0 km/h **5.6 mph**. The variable capacity travel motors allow the operator to select the optimum speed to match specific jobs. Travel control lock lever and neutral switch.

Travel speed (quick shift mode)	Forward	Reverse
1st	0–3.4 km/h **0–2.1 mph**	0–4.1 km/h **0–2.5 mph**
2nd	0–5.6 km/h **0–3.5 mph**	0–6.5 km/h **0–4.0 mph**
3rd	0–9.0 km/h **0–5.6 mph**	0–9.0 km/h **0–5.6 mph**

Travel speed (variable mode)	Forward	Reverse
	0–9.0 km/h **0–5.6 mph**	0–9.0 km/h **0–5.6 mph**



FINAL DRIVE

Two-stage planetary gear integrated into axial piston travel motors. Compact in-shoe mount reduces risk of damage by debris. Bolt-on sprocket segments for easy replacement.

STEERING

Palm Command Control System (PCCS) joystick control for all directional movements. Pushing the joystick forward results in forward machine travel, while pulling it rearward reverses the machine. Simply tilt the joystick to the left or right to make a turn. Tilting the joystick fully to the left or right activates counter-rotation. Hydrostatic Transmission (HST) eliminates steering clutches and brakes, providing smooth powerful turns. Fully electronic control enables smooth control. The PCCS utilizes shift buttons to increase and decrease speed.

Minimum turning radius:

D51EX-22	2.39 m	**7'10"**
D51PX-22	2.62 m	**8'7"**

As measured by track marks on the ground at pivot turn.

UNDERCARRIAGE

Suspension	Oscillating equalizer bar and pivot shaft
Track roller frame	Monocoque, large section, durable construction
Rollers and idlers	Lubricated track rollers

Lubricated tracks

Unique seals prevent entry of foreign abrasive material into pin to bushing clearances to provide extended service life. Track tension is easily adjusted with a grease gun.

	D51EX-22	D51PX-22
Number of track rollers (each side)	7	7
Type of shoes (standard)	Single grouser	Single grouser
Number of shoes (each side)	44	44
Grouser height	54 mm **2.1"**	54 mm **2.1"**
Shoe width (standard)	510 mm **20"**	710 mm **28"**
Ground contact area	28000 cm² **4,340 in²**	38980 cm² **6,042 in²**
Ground pressure (with dozer, ROPS cab)	44.2 kPa 0.45 kgf/cm² **6.40 psi**	33.4 kPa 0.34 kgf/cm² **4.76 psi**
Track gauge	1790 mm **5'10"**	1880 mm **6'2"**
Length of track on ground	2745 mm **9'0"**	2745 mm **9'0"**

COOLANT AND LUBRICANT CAPACITY (REFILLING)

Coolant	35 ltr	**9.3 U.S. gal**
Fuel tank	270 ltr	**71.3 U.S. gal**
Engine oil	20 ltr	**5.3 U.S. gal**
Hydraulic tank	63 ltr	**16.6 U.S. gal**
Final drive (each side)	4.0 ltr	**1.1 U.S. gal**

OPERATING WEIGHT (APPROXIMATE)

Tractor weight:

Including ROPS cab, rated capacity of lubricant, coolant, full fuel tank, operator, and standard equipment.

D51EX-22	11100 kg	**24,471 lb**
D51PX-22	11500 kg	**25,353 lb**

Operating weight:

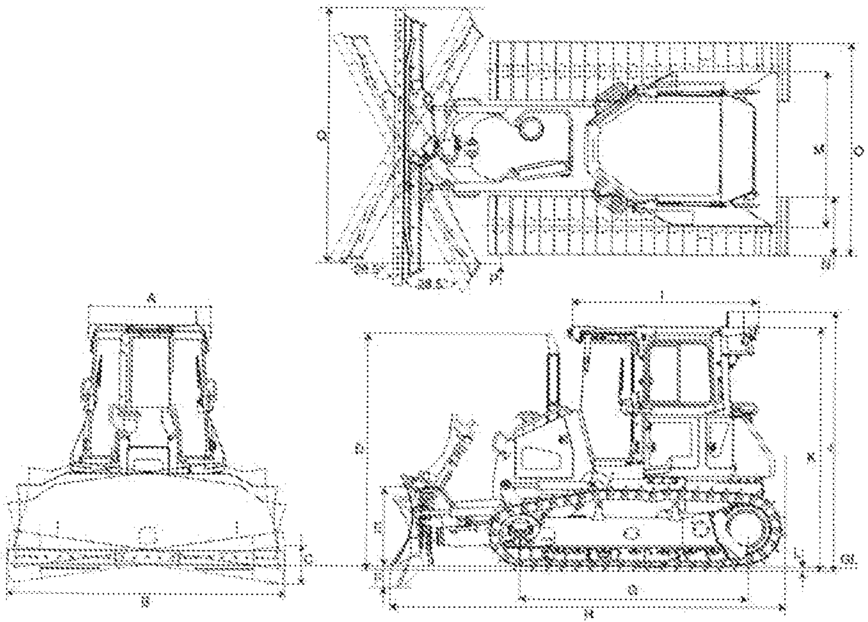
Including power angle tilt dozer, ROPS cab, operator, standard equipment, rated capacity of lubricant, coolant, and full fuel tank.

D51EX-22	12600 kg	**27,778 lb**
D51PX-22	13100 kg	**28,881 lb**

DIMENSIONS

	D51EX-22		D51PX-22	
A	1260 mm	4'2"	1280 mm	4'2"
B	3045 mm	10'0"	3350 mm	11'0"
B*	3350 mm	11'0"	----	
C	459 mm	1'6"	505 mm	1'8"
C*	505 mm	1'8"	----	
D	2885 mm	9'5"	2885 mm	9'5"
E	1107 mm	3'8"	1107 mm	3'8"
F	461 mm	1'6"	461 mm	1'6"
G	2745 mm	9'0"	2745 mm	9'0"
H	4800 mm	15'8"	4800 mm	15'8"
I	2245 mm	7'4"	2245 mm	7'4"
J	3177 mm	10'5"	3177 mm	10'5"
K	2997 mm	9'9"	2997 mm	9'9"
L	54 mm	2.1"	54 mm	2.1"
M	1790 mm	5'10"	1880 mm	6'2"
N	510 mm	1'8"	710 mm	2'4"
O	2300 mm	7'6"	2590 mm	8'6"
P	29 mm	1.86"	16 mm	0.63"
P*	161 mm	6.3"	----	
Q	2725 mm	8'11"	2990 mm	9'9"
Q*	2990 mm	9'9"	----	

*Wide blade for D51EX-22



Ground clearance . . . . 385 mm **15.2"**

HYDRAULIC SYSTEM

Closed-center Load Sensing System (CLSS) designed for precise and responsive control and for efficient simultaneous operation.

Hydraulic control unit:
All spool control valves externally mounted remote to the hydraulic tank. Piston-type hydraulic pump with capacity (discharge flow) of 99 ltr/min **26.2 U.S. gal/min** at rated engine rpm.

Relief valve setting. . . . . 27.4 MPa, 280 kg/cm² **3,983 psi**

Hydraulic cylinders . . . . Double-acting, piston type

	Number of cylinders	Bore	
Blade lift	2	90 mm	3.54"
Blade tilt	1	100 mm	3.94"
Blade angle	2	90 mm	3.54"

Hydraulic oil capacity (refilling):
Power angle tilt dozer . . . . 63 ltr **16.6 U.S. gal**

Control valves:
3-spool control valve for power angle tilt dozer.
Positions:
- Blade lift. . . . . Raise, hold, lower, and float
- Blade tilt . . . . Right, hold, and left
- Blade angle. . . . . Right, hold, and left

Additional control valve required for ripper.
Positions:
- Ripper lift . . . . Raise, hold and lower

DOZER EQUIPMENT

Use of high tensile strength steel in moldboard for strengthened blade construction.

	Overall Length With Dozer	Blade Capacity (SAE)	Blade Width x Height	Maximum Lift Above Ground	Maximum Drop Below Ground	Maximum Tilt Adjustment	Blade Angle
D51EX-22 PAT Standard Blade	4800 mm **15'8"**	2.7 m³ **3.5 yd³**	3045 mm x 1110 mm **10'0" x 3'8"**	1107 mm **3'8"**	461 mm **1'6"**	459 mm **1'6"**	28.5
D51EX-22 PAT Wide Blade	4800 mm **15'8"**	2.9 m³ **3.8 yd³**	3350 mm x 1110 mm **11'0" x 3'8"**	1107 mm **3'8"**	461 mm **1'6"**	505 mm **1'8"**	28.5
D51PX-22 PAT Standard Blade	4800 mm **15'8"**	2.9 m³ **3.8 yd³**	3350 mm x 1110 mm **11'0" x 3'8"**	1107 mm **3'8"**	461 mm **1'6"**	505 mm **1'8"**	28.5

STANDARD EQUIPMENT FOR BASE MACHINE

ENGINE AND RELATED ITEMS
- Air cleaner, dry, double element type with caution lamp on monitor
- Decelerator pedal
- Engine, KOMATSU SAA6D107E-1, net output of 97 kW **130 HP** direct injection, turbocharged, air-to-air aftercooler, EPA Tier 3 emissions certified
- Exhaust pipe elbow
- Fan, hydraulic driven, electronic control, reversible
- Fuel pre-filter (10 micron) and fuel filter (2 micron)
- Grid heater
- Intake pipe with precleaner
- Water separator

ELECTRIC SYSTEM
- Alternator, 60 amp (24 V)
- Back-up alarm
- Batteries, large capacity 1000 CCA,170Ah
- Starting motor, 5.5 kW

POWER TRAIN AND CONTROLS
- Brake pedal
- Counter rotation
- Electronically controlled Hydrostatic Transmission (HST) with Quick-shift and variable speed settings
- Palm Command Control System (PCCS) with electronic control for travel control
- Reverse speed presets

UNDERCARRIAGE
- Idler cushions
- Track frames
- Track roller guards, center and end section
- Sprockets, segmented type
- Track shoe assembly w/sealed and lubricated link assembly:
  - —D51EX-22: 510 mm **20"** HD single grouser shoes
  - —D51PX-22: 710 mm **28"** HD single grouser shoes

GUARDS AND COVERS
- Crankcase guard and underguard
- Engine hood and side panels
- ROPS/FOPS*
- Sprocket inner guard

OPERATOR ENVIRONMENT
- 12 amp (12V) power port (cab only)
- Cab seat, high back fabric, suspension type
- Canopy seat, high back vinyl, suspension type
- Cigarette lighter (24 V, cab only)
- Cup holder, lunch box holder
- Electronic monitor panel with on-board diagnostics
- Foot rest, high mounted
- Horn
- Provision for radio (cab only)
- Rearview mirror
- Seat belt, 76 mm **3"** wide retractable

DOZER ASSEMBLY
- Power angle tilt dozer assembly, inside arms (EX: 3045 mm **10'** blade, PX: 3350 mm **11'** blade)

HYDRAULICS AND CONTROLS
- Accumulator for Proportional Pressure Control (PPC)
- Hydraulics for PAT dozer
- Palm Command Control System (PCCS) with Proportional Pressure Control (PPC) for blade control

VANDALISM PROTECTION
- Filler cap locks and cover locks
- Instrument panel lock and cover (canopy only)

OTHER STANDARD EQUIPMENT
- Grease gun holder
- Hitch, standard type
- High altitude arrangement (no fuel adjustment up to 3000 m **9,843 ft**)
- KOMTRAX function Level 2
- Lighting package - (3 front, 2 rear cab/canopy)
- Marks and plates, English
- Pullhook, front

* ROPS cab or ROPS canopy must be ordered for all machines. Cab and canopy FOPS Level 2. ROPS/FOPS meets all OSHA/MSHA standards and regulations criteria.

Dozer assembly and rear-mounted equipment are not included in base machine price.

OPTIONAL EQUIPMENT

TRACK SHOE ASSEMBLY WITH SEALED AND LUBRICATED LINK ASSEMBLY
- D51EX-22
  - – 560 mm **22"** single grouser, HD link

TRACK RAIL ASSEMBLY WITH ABRASION RESISTANT (AR) BUSHINGS AND SEALED AND LUBRICATED LINK ASSEMBLY
- D51EX-22
  - – 510 mm **20"** single grouser, HD link with AR bushings
  - – 560 mm **22"** single grouser, HD link with AR bushings
- D51PX-22
  - – 720 mm **28"** single grouser, HD link with AR bushings

DOZER ASSEMBLY
- D51EX-22 – 3350 mm **11'** blade

TRACK ROLLER GUARDS
- Track roller guards, segmented, full length

OPERATOR ENVIRONMENT
- Cab machine
  - – Seat, suspension type, fabric, high back
  - – Seat, suspension type, fabric low back
  - – Seat, air suspension type, fabric high back
- Canopy machine
  - – Seat, suspension type, vinyl, low back

DRAWBAR
- Long drawbar

REAR EQUIPMENT AND HYDRAULICS
- Ripper, multi-shank (D51EX-22 only)
- Rear, hydraulics (D51EX/PX-22)

ROPS CANOPY AND ROPS CAB EQUIPMENT
- ROPS canopy with lower heater
- ROPS cab (includes air conditioner with heater, defroster, pressurizer)
  - – Optional radio, AM/FM, cassette

OPERATOR ENVIRONMENT
- Forestry guards for cab and canopy

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Materials and specifications are subject to change without notice

Evidence Appendix 8

PATENT

KL-US050678

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : *Confirmation No. 7520*

Kazumasa Fukazawa et al. :

Serial No. 10/681,253 :

Filed: October 9, 2003 :

For: BULLDOZER WITH IMPROVED VISIBILITY (As Amended) :

DECLARATION OF MASAYUKI MUKAINO UNDER 37 CFR §1.132

I, Masayuki Mukaino, pursuant to 37 CFR §1.132, hereby declare:

1. I am a co-inventor of the invention disclosed in the above-identified application.

2. I am currently a general manager of Small Size Machine Development Group of Komatsu Ltd in Japan. I have been working as an engineer in the construction equipment manufacturing field for the past 30 years. Therefore, I believe I possess experience, skill and knowledge of what one of ordinary skill in the construction equipment manufacturing field would possess.

3. A work vehicle disclosed in Japanese Utility Model Patent Application Publication No. S51-63032 to Yoshida (hereinafter "Yoshida publication") is a so-called "track loader", which is equipped with a bucket instead of a bulldozer blade. Unlike a bulldozer blade whose main function is to push material such as soil (i.e., excavation, soil transportation and land preparation operations), a bucket of the track loader is usually used for picking and loading material, and the bucket filled with material is moved up and down during loading operation. In other words, the track loader requires a different performance expected from a bulldozer. Therefore, the design object for a track loader disclosed in the Yoshida publication is completely different from that of a bulldozer. More specifically, in order to counterbalance load imparted on the bucket during loading operation, the Yoshida publication discloses a structure in which the radiator and the fan are placed on the rear side of the operator seat so that the center of gravity of the vehicle is placed toward the rear side (see, lines 9-11 on page 2). Generally, in a case of a track loader, the center of gravity is preferably

placed toward the rear of the vehicle as much as possible. More specifically, as shown in Fig. 1 of Exhibit A attached herewith, a bucket capacity of a track loader (which defines the specification of a track loader) is equal to a weight Wb imparted on the bucket, which is expressed as follows:

$Wb = Wg \times (L-Lg)/(Lb-L)$

Wb: Weight imparted on the bucket
Wg: Weight of the vehicle
L: Ground contact length
Lg: Distance between the center of gravity and a center of the sprocket
Lb: Distance between the bucket and the center of the sprocket

Therefore, it is desirable when designing a track loader to reduce the distance Lg as much as possible. See, Fig. 1 in Exhibit A.

On the other hand, in general, a position of the center of gravity of the bulldozer body is preferably set with respect to a ground contact length L and a distance Lg between the center of gravity and a center of the sprocket to satisfy the following relationship (see, Fig. 2 in Exhibit A):

$Lg/L \times 100 = 48\text{-}55\%$

Lg: Distance between the center of gravity and the center of the sprocket
L: Ground contact length

The reasons behind this are as follows:

(a) The vehicle stability on soft ground is improved by evening out the distribution of the contact pressure q (see, Fig. 3 of Exhibit A). Placing the center of gravity disproportionately toward the front or the rear causes the contact pressure q on one side of the vehicle to increase, and thus, the tracks of the bulldozer will be more prone to sink in ground (see, Fig. 4 of Exhibit A). Therefore, the vehicle body is tilted and/or slippage occurs, which decreases the work efficiency. Moreover, the center of gravity is placed approximately at the center of the ground contact length L so that there will be no variance between the push-up operation and the push-down operation on a slope (see, Figs. 5 and 6 in Exhibit A). More specifically, if the center of gravity is placed at the rear of the vehicle, the push-down work efficiency will be improved but the push-up work efficiency will be significantly reduced. Therefore, such a bulldozer is not usable in a field.

(b) The edge force Fb of the bulldozer blade (see, Fig. 7 of Exhibit A) is ensured by placing the center of gravity around the center position of the ground contact length L. The force Fb for penetrating the blade edge into the ground is generally expressed as follows:

Fb = Wg x Lg/Lb

Fb: Blade edge force

Wg: Weight of the vehicle

Lg: Distance between the center of gravity and the center of the sprocket

Lb: Distance between the blade and the center of the sprocket

If this force Fb is small, the blade cannot penetrate into a hard surface. Therefore, in a case of a bulldozer, it is not desirable to place the center of gravity toward the rear of the vehicle (i.e., it is desirable to increase the distance Lg between the center of gravity and the center of the sprocket).

Accordingly, placing the center of gravity on the rear side of the vehicle as proposed in the Yoshida publication is undesirable in the bulldozer with a bulldozer blade. Thus, I believe one of ordinary skill in the art would not have considered it obvious to place the cooling module on the rear side of the bulldozer in view of the disclosure in the Yoshida publication because (1) counterbalancing the load imparted on the bucket is not a concern when designing a bulldozer, and (2) moving the center of gravity toward the rear side of the vehicle is not desirable when designing a bulldozer.

4. Moreover, even assuming for the sake of argument that the arrangement of the cooling module disclosed in the Yoshida publication were applied to a bulldozer, it would not have been obvious to place the cooling module in a cooling module recess formed between the tracks or between the first and second tank modules. More specifically, I believe it is not possible in the structure disclosed in the Yoshida publication to provide such a cooling module recess. In the Yoshida publication, it appears the steering case (housing a bevel gear, a brake and a clutch), the final drive and the fuel tank are placed on the rear side of the vehicle body (see, Exhibit B). Therefore, there is no space for providing a cooling module between the tracks or between the tank modules in the Yoshida publication. Accordingly, it is not obvious to modify the structure disclosed in the Yoshida publication to move the cooling

module in a cooling module recess formed between the tracks or between the tank modules.

5. Although the Yoshida publication discloses that a radiator and a fan are so big and heavy that they make an influence on gravity center location of a track loader, in the case of a modern bulldozer, I believe moving a position of a cooling module does not considerably influence overall weight balance of the bulldozer because the weight of the cooling module is relatively small with respect to the total weight of the bulldozer. This is because a cooling module is much lighter today than in the early 1970s. The Yoshida publication was filed in 1974. At that time, almost all radiators were mainly made of copper and most fans were made of steel. In order to meet the social demand for less fuel consumption and material recycling, however, most radiators are made of aluminum and many fans are made of plastics nowadays. Thus today's cooling module weighs less than one third of the corresponding size cooling module in the early 1970s. For example, with Komatsu D51EX-22, which is a medium size bulldozer, the operating weight of the bulldozer is about 12.6 ton (12600 kg) while the weight of the cooling module is only about 143 kg. Therefore, the cooling module accounts for only about 1.1 % of the total weight of the bulldozer. When a shift amount of the center of gravity caused by moving the cooling module from a front side to a rear side of the vehicle is estimated by using this bulldozer, the influence thereof is only about 1%. Even with a smaller size bulldozer such as Komatsu D20A-8E0, the operating weight of the machine is about 3.89 ton (3890 kg) while the weight of the cooling module is only about 37 kg, which accounts for only about 1 % of the total weight. Therefore, placing the cooling module on the rear side of the vehicle in the bulldozer does not create a tremendous imbalance in weight distribution, which requires considerable rearrangement of the parts of the bulldozer.

6. I believe one having ordinary skill in the art would reasonably ascertain that the drawings of U.S. Patent No. D483,043 to Akashima et al. (hereinafter "Akashima et al. patent") show only one tank disposed on the left side of the operator seat. In the drawings of the Akashima et al. patent, the part on the left side of the operator seat includes a fuel cap, and thus, it is reasonably understood that this part on the left side has a fuel tank. On the other hand, the part disposed on the right side of the operator seat does not seem to have a tank because it does not have a filing cap, and instead, it

appears to have a release latch (FIG. 2) with a butterfly hinge structure (FIG. 4). Therefore, the part on the right side of the operator seat appears to be a cover member that opens/closes by using the release latch. Therefore, I believe one having ordinary skill in the art would reasonably conclude, by looking at the drawings of the Akashima et al. patent, it is unreasonable to guess that the right side has a tank. The Akashima et al. patent claims priority to a Japanese design patent application which issued as Japanese Design Patent No. 1193249 S (Exhibit C). The Japanese Design Patent No. 1193249 S describes that a battery and a battery cover are disposed on the right side of the operator seat while a fuel tank is disposed on the left side.

7. The conventional bulldozer illustrated in FIG. 1 of the present application corresponds to Komatsu D41-6 model bulldozer. In this conventional bulldozer, the fuel tank extends laterally on the rear side of the cab and the hydraulic fluid tank is disposed on the right-rear side of the cab (please see Exhibit D). As shown in Exhibit D, the size of the fuel tank in the bulldozer is about three times as large as the size of the hydraulic tank. Therefore, although there are some variations with respect to positions of the tanks on the bulldozer, the fuel tank is commonly arranged to extend laterally on the rear side of the bulldozer to accommodate large size of the fuel tank. Thus, one having ordinary skill in the art would reasonably ascertain by looking at FIG. 1 of the present application that the fuel tank laterally extends on the rear side of the cab. Accordingly, for the sake of argument, if one having ordinary skill in the art were to modify the conventional bulldozer illustrated in FIG. 1 of the present application in view of the Pack publication to place the radiator on the rear side of the bulldozer, then the radiator would be placed behind the fuel tank. In other words, the fuel tank would interpose between the radiator and the cab in such a modified arrangement because there is nothing in these two references or the Akashima et al. patent that would provide one of ordinary skill in the art with a reason to move the fuel tank to the side and also create a cooling module recess between the tracks or the tanks.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001

of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Masayuki Mukaino

Masayuki Mukaino

Dated: June 29 2010

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Exhibit A (1/2)

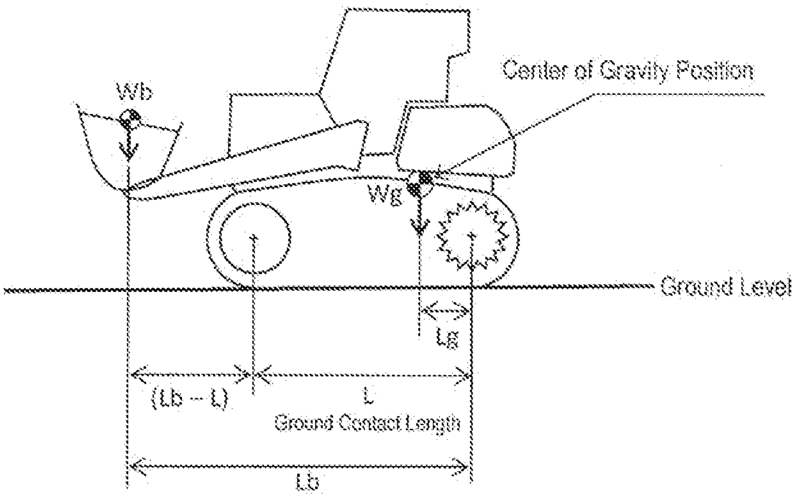


Fig. 1 – Track Loader

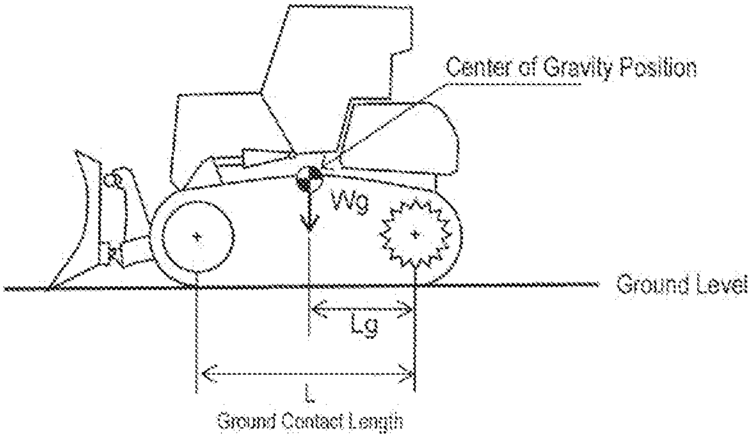


Fig. 2 – Bulldozer

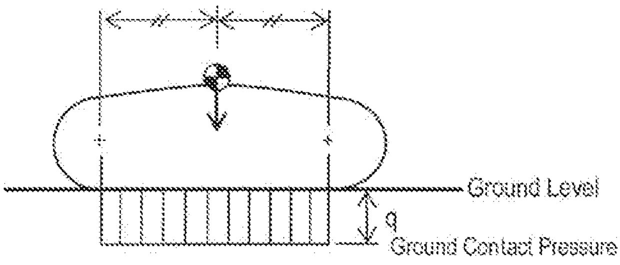


Fig. 3

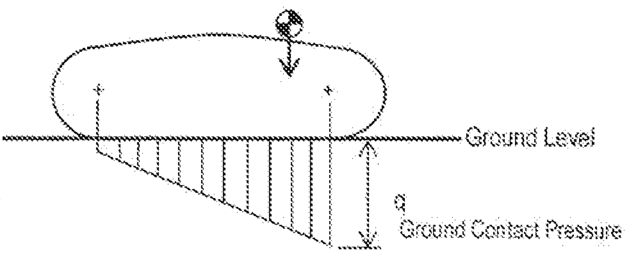


Fig. 4

Exhibit A (2/2)

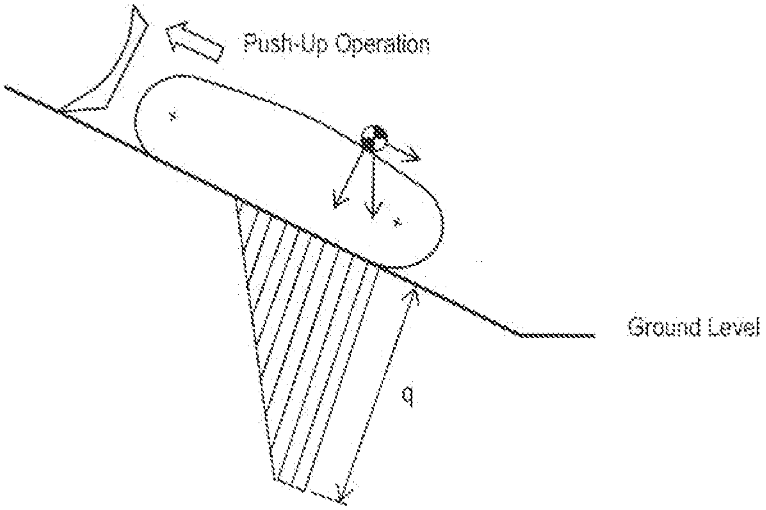


Fig. 5

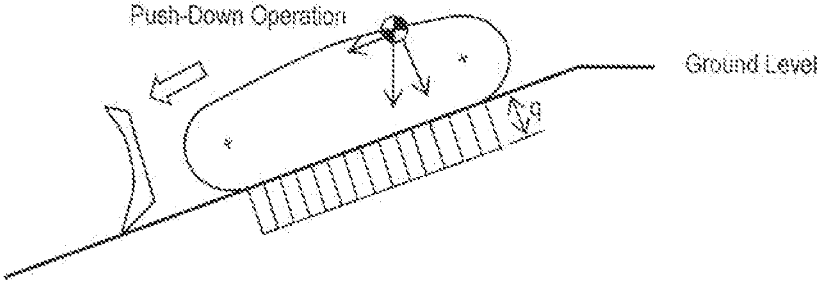


Fig. 6

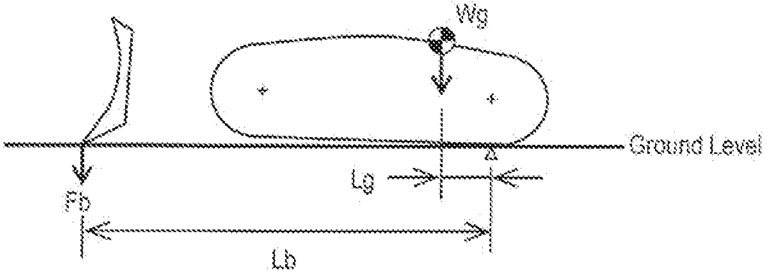
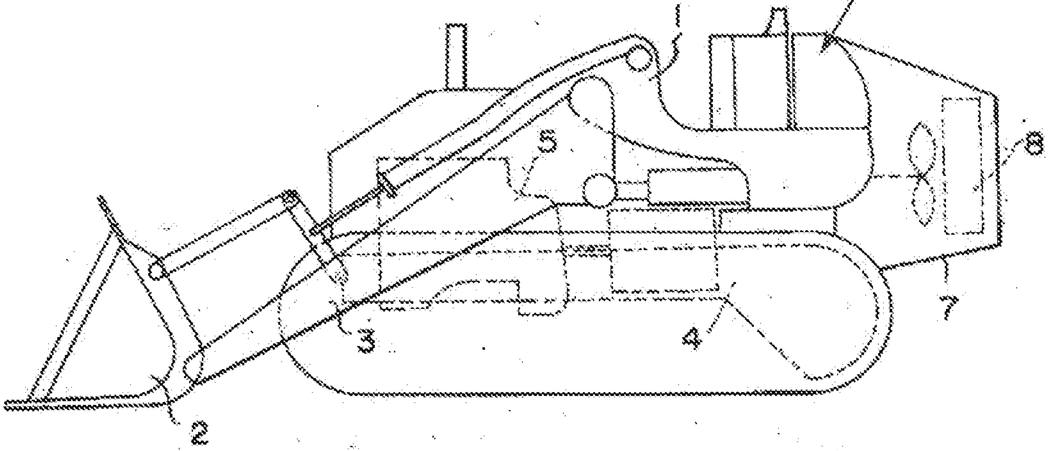


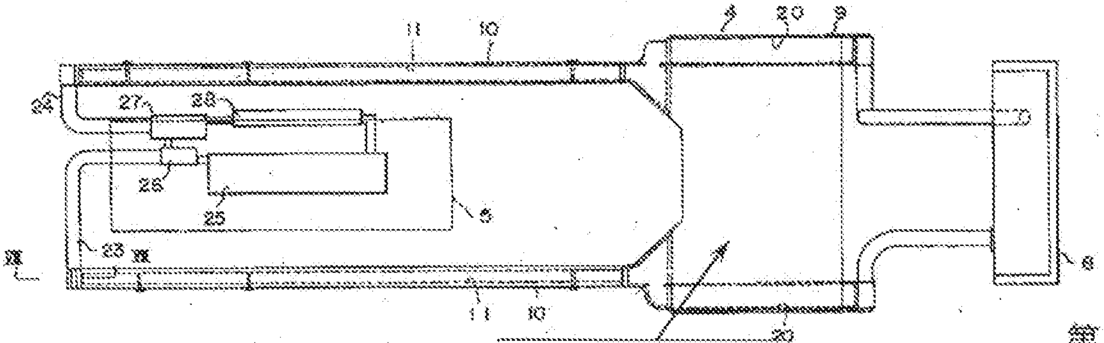
Fig. 7

Exhibit B



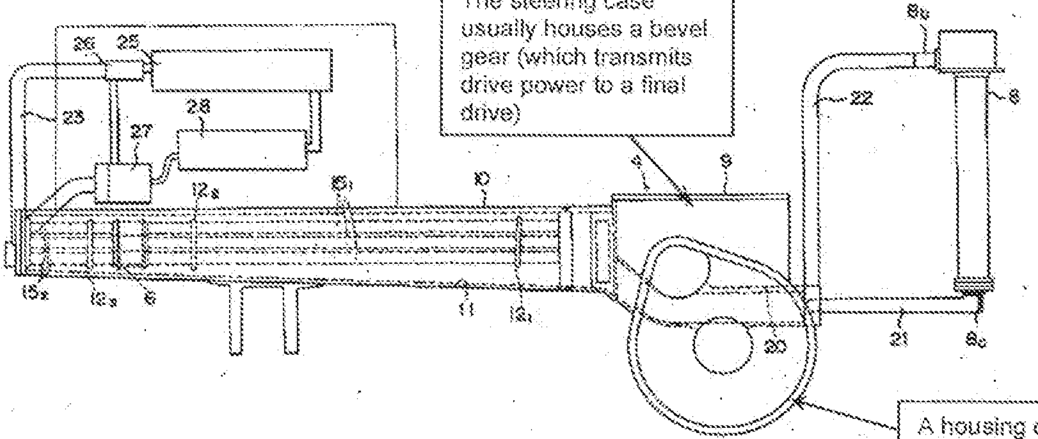
This part appears to be a fuel tank.

第2図



The steering case usually houses a bevel gear (which transmits drive power to a final drive)

第3図



A housing case for installing the final drive

Yoshida Publication – Figs.1-3

Exhibit C

English Translation of Japanese Design Patent No. 1193249 S

(19) [Issue Country] Japan patent Office (JP)
(45) [Issue Date] Heisei 16, January 6 (2004.1.6)
(12) [Publication Type] Design Patent Publication
(11) [Patent Number] Design Patent No. 1193249 (D1193249)
(24) [Registration Date] Heisei 15, November 7 (2003.11.7)
(54) [Subject of Design Patent] Tractor
(52) [Design Patent Classification] G2-231
(51) [Int'l Classification (reference)] 12-09
(21) [Application Number] Design Application No. 2002-25776 (D2002-25776)
(22) [Application Date] Heisei 14, September 20 (2002.9.20)
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[Benrishi]
[Name] Satoshi Watanabe
[Examiner] Hiroyasu Nukushina
(56) [Reference Publications] Design Patent No. 1058211, Design Patent No. 1112766
(55) [Description Subject of Design Patent] This article is a tractor having a small overall width as compared to an overall longitudinal length, suitable for agricultural work especially in orchard and the like. By arranging conventional parts of a tractor in a balanced manner, the center of gravity is placed at a low position while ensuring a sufficient minimum ground clearance. A gate-shaped mid-rops is arranged a generally longitudinal center part of the vehicle across the entire width, and the mid-rops is foldable toward the forward direction. Also, this article has a left-right asymmetric design with a fuel tank being disposed immediately on left side of an operator seat (near side in the right-side elevational view), a battery and a battery cover are disposed immediately on right side of the operator seat (near side in the left-side elevational view), and a exhaust pipe is disposed on a front-left portion of the vehicle body. Also, a drive device of the tractor has a rubber crawler (v-shaped lag).

Exhibit D

Komatsu D41-6 Model Bulldozer